SUPERIOR
Manufacturing & Hydraulics

TECHNICAL MANUAL

5 1/2" CLINCHER® XHT TONG

AND

5 1/2" LOCKJAW™ XHT DRILL PIPE BACKUP

COVERS

TONG MODELS

CLE5500XHT / CLE5500XHT01, 02

BACKUP MODELS

BUCD55XHT / BUCD55XHT-01, -02

HANGER ASSEMBLY

BUCD5900, -01

4225 Highway 90, East
Broussard, Louisiana 70518
Phone: (337) 837-8847
Fax: (337) 837-8839
www.superior-manf.com

Published: 08/2002

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The products described in this manual are covered by U.S. and foreign Patents and/or pending Patent Applications.

This manual is not a controlled document and is subject to revision without notice. To receive updates and insure you have access to the latest information concerning the 5 1/2" **CLINCHER®** XHT Tong and **LOCKJAW™** XHT Drill Pipe Backup, we request you complete this form and return the lower half to SUPERIOR Manufacturing and Hydraulics by mail or facsimile. Access to our manuals can also be acquired through our web site www.superior-manf.com. Select the tab '**CLINCHER®** Products', select the equipment from the list to get Specs page, select the tab 'Download Manual'.

Name: _____
Company: _____
Address: _____
Address: _____
City: _____ **State:** _____
Postal Code: _____ **Country:** _____
Telephone: _____ **Fax:** _____

Tong Model No.: _____ **Serial No.:** _____
Backup Model No.: _____ **Serial No.:** _____
Assembly Date: _____

---

5 1/2" CLINCHER® XHT Tong and LOCKJAW™ XHT Drill Pipe Backup
Technical Manual Registration Form

Name: _____
Company: _____
Address: _____
Address: _____
City: _____
Postal Code: _____ **Country:** _____
Telephone: _____ **Fax:** _____

Tong Model No.: _____ **Serial No.:** _____
Backup Model No.: _____ **Serial No.:** _____
Assembly Date: _____

Return To:

SUPERIOR Mfg. & Hyd.
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Broussard, LA 70518
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5 1/2" CLINCHER® XHT TONG and 5 1/2" LOCKJAW™ DRILL PIPE BACKUP

REVISION TABLE

Section	*Page*	*Date*	*Description*
7A	26	10/01/02	Pick List Revision: KITBRG-13
9	1, 6-A, 7, 8, 9, 17	10/01/02	Table of Contents: Added Gear Train Revised Illustrations: Idler Gear Assy, Pinion Gear Assy, Smart Gear Assy, & Tong Door Assy.
2	3	02/25/04	Revised Specs: Added Max. Allowable Flow Rate using Std. A-20 Valve Pkg. Changed Gripping Range for **LOCKJAW™** DP Backup from 3/8" to 1/4" undersize.
3	0.1, 9-16	02/25/04	Added Dovetail Straight Tooth & Diamond Tooth Die information. Replaced charts Max. & Min. Adapter Gripping Diameter for BUDT55-XXXX DT Die Adapters for BUCD5500 & BUCD55XHT, with chart for 5 1/2" XHT Tong and chart for 5 1/2" LJ Backup for Drill Pipe. Tong has 3/8" min. undersized, LJ Backup for Drill Pipe has 1/4" min. undersized. Replaced Tech Update Rev.5.0 with Rev.6.0.
7A	11-16, 18, 23-25	02/25/04	Revised Parts Lists CLE5500XHT01, 59001-01, & KITBOLT-13.
7C	3 & 5	02/25/04	Revised Parts List BUCD5900.
9	1, 6.1-6.2, 8-9, 16-18, 23	02/25/04	Added Illustrations Sealed Idler Bearing PN 1905, Installation Instructions for PN 1905, & Upper Low Drive Gear Assy. Revised Illustrations Pinion Gear Assy, Smart Gear Assy, Bottom View w/o Legs, Tong Door Assy, Door Switch Assy, Splined Jaw Assy.
10	10	02/25/04	Revised Illustration Mounting Kit Assy.
11	1	02/25/04	Revised Illustration Lift Cylinder Assy.
12	3-8	02/25/04	Added Superior Compression Torque System Manual.
Cover	Cover	05/07	Removed ISO emblems. Removed BUCD5500 Backup.
Title Pg	Title Pg		Removed ISO emblems. Removed BUCD5500 Backup.
3	13-16		Removed ISO emblems.
12	3-8		Removed ISO emblems.
TOC	TOC	05/07	Section 7A, B, C-Removed Parts Lists. Section 10 - XHT Backup only.
3	2-3, 7, 9-11	05/07	Corrected PN's for Tong Steel, Aluminum & **GRIT FACE™** Dies. Corrected doors & wedges on DT Die Illustration for BUCD5500. Tong Dovetail Jaw Chart – Corrected die length from 5" to 3 7/8", corrected insert Part Numbers. Backup Dovetail Adapter Chart – Corrected die length from 5" to 3 7/8" on last 2 rows. Splined Chart – Added LF Jaw CJ-LF-59B.
4	3	05/07	Removed Assy. Instructions note.
9	1, 3, 6A, 8, 11, 16, 17, 21, 23	05/07	Revised TOC, added Splined LF Jaw CJ-LJ-59B. Revised illustrations Top View sht.1, Gear Train, Pinion Gear Assy., Shifting Gear Assy. 2nd Generation, Bottom View, Tong Door Assy., Side Handle Assy., Splined Jaw Assy.
10	1, 4-8, 11	05/07	Revised TOC & illustrations Backup Assy. w/o Top Plate, Top View w/o Top Plate, Cylinder Assy., Inside Door Assy., Outside Door Assy., Valve Bank 4.
13	1-22	05/07	Replace Rineer Motor Manual with Publication DS151005 8/03.
14	1-34	05/07	Replaced Valve information with current publications.
Cover Title Pg.	Cover Title Pg.	11/07	Added Backup Model BUCD55XHT-01.
10	1-3, 7-8, 11-12	11/07	Added illustration BUCD55XHT-01. Revised illustration BUCD55XHT. Added Door Assy. No.'s to illustrations. Revised Valve Bank Assy & Schematic (Tong Door Valve was backwards).
10	1 & 13	12/03/07	Added Schematic for CLE5500XHT-01 & BUCD55XHT-01.
9	8.1	12/05/07	Revised illustration Upper Low Drive Gear Assy.
10	7-8	12/05/07	Revised illustrations Inside Door Assy. & Outside Door Assy.
14	35	12/05/07	Added Tech. Data for BUCST7699 Manifold Assy.

REVISION TABLE

Section	*Page*	*Date*	*Description*
3	6	01/18/08	Added sizes 2 3/8" thru 5 1/4" using dovetail die adapters BUDT55-XXXX.
	10		Revised 5 1/2" uses BUCX55005500. Rev. LJ DP Backup DT Adapt./Die Chart.
9	8, 17	01/18/08	Revised illustrations Pinion Gear Assy. & Tong Door Assy.
10	9	01/18/08	Revised illustration Backup Dovetail Die Adapter.

5 1/2" CLINCHER® XHT Tong and LOCKJAW™ Drill Pipe Backup

HAZARD WARNING

Nomenclature used in this manual:

WARNING	concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life
Caution	concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment
Note	concerns an operating procedure or practice that needs highlighting

CLINCHER® XHT Tongs and Backups are manufactured to provide a means of making up or breaking out high torque tubular connections. They utilize high pressure hydraulic fluid power which can cause the tong to move suddenly and with great force if the tong is not properly rigged up and operated. **CLINCHER®** Tongs and Backups contain rotating and reciprocating parts which can severely or fatally injure personnel who are operating, repairing, or near this equipment during its operation. **WARNING: Tongs and Backups are not to be operated by untrained personnel or personnel with diminished physical or mental capacity. No work of any type, including changing of dies, is to be carried out while the tong and backup are connected to any hydraulic power unit.**

CLINCHER® XHT Tongs and Backups are heavy tools. They should be suspended from a secure, high strength 7/8" IWRC minimum diameter wire cable with a 31 ton minimum breaking strength. The wire rope should be hung as close to the center of the wellbore as possible, without interfering with drilling equipment operation, to allow the tong to be readily swung into the working position. Vertical position control should be achieved by means of a **CLINCHER®** hydraulically operated lift cylinder/spring hanger. **WARNING: Users must insure the entire suspension system including cables, rig mounting points, lift cylinders, tong lifting brackets/bridles, winches, pulleys, counter weights, etc., are capable of handling the static weight of the tong and backup plus any loads which could be transferred to it during the makeup or breakout process PLUS any shock loads which may be seen during operation. This system must readily allow downward movement equal to a minimum of the thread makeup distance to avoid overloading the suspension system and/or damage to equipment.**

A 1 1/2" IWRC minimum diameter wire cable with a 114 ton minimum breaking strength or better, should be attached at a 90 degree angle to the tong and at the same level to insure proper readout of torque indicator. A SNUBBING LINE should always be attached even when an integral backup is in use to provide additional safety in the event of a backup slippage. **WARNING: Users must provide a means of safely controlling the tong and backup movements in all directions when it is in use. Failure to account for its size, weight, movement and the amount of torque developed could result in personnel injury or death.**

5 1/2" CLINCHER® XHT Tong and LOCKJAW™ Drill Pipe Backup

HAZARD WARNING

CLINCHER® Tongs and Backups utilize high pressure hydraulic fluids. Portions of the tong and backup, control valves, hydraulic lines and cylinders may contain high pressure fluid even when the power unit is de-energized and the fluid supply hoses are disconnected. During normal operation the temperature of the hydraulic fluids as well as hoses, piping, valves, etc., can rise to a level which can cause burns. **WARNING: Personal protective gear including safety glasses, face shields, protective gloves and protective clothing must be worn to guard against the hazards of high pressure fluids. Tight fitting clothing is required to prevent entanglement in rotating components. These tools should be serviced by thoroughly trained and qualified hydraulic technicians using procedures to safely insure hydraulic pressure is bled from these circuits.**

The **CLINCHER®** XHT Tong is equipped with a door interlock system which prevents tong rotation whenever the door is open. This system is to be tested before each mobilization and at every shift change. Should this system be determined to be inoperative, the tong is to be removed from service and tagged as ***in-operative*** until repairs are made. **CAUTION:** Operating the tong with the door in the open position could result in severe damage to the equipment and will void all manufacturer warranties. **WARNING: Operating the tong with the door open by means of a defective or bypassed door interlock system exposes the operator and nearby personnel to potentially fatal hazards.**

No attempt should be made to operate the **CLINCHER®** XHT Tong and Backup for any purpose other than which it is intended. This system is capable of generating very large clamping forces and torsional loads which, if improperly applied or controlled, could result in damage to the tubular, to the tong and backup, or could possibly result in injury or death of personnel. Do not attempt to operate the unit without correct dies and the proper size tubular being in the tong and backup. See Section 3 for more information concerning the selection and use of dies.
CAUTION: Operating this equipment without the correct size, type, and orientation of dies can result in damage to the equipment or tubulars being handled.

HYDRAULIC PRODUCT SAFETY

WARNING: Valve lever (spool) may "stick" (not center) under certain conditions allowing the hydraulic equipment to continue to operate and could cause serious injury, death or equipment failure.

VALVE SAFETY: Read and follow instructions carefully. Failure to observe instructions and guidelines may cause serious injury, death or equipment failure. A sticking valve (spool bind) may be caused by one or more of the following factors:

DIRTY OIL: Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner's manual for filtration and changing recommendations for internal systems.

OIL REQUIREMENTS: Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Certain synthetic oils may cause spool seals to swell and the valve to stick. If in doubt, call CROSS Engineering.

IMPROPER HOOK UP OR MOUNTING: Always use the proper size fittings. Hook up "in" & "out" as noted on the valve body. Do not overtorque pipe fittings. Mounting surfaces should be flat and care should be used when tightening mounting bolts. Over-tightened bolts can cause spool bind and casting breakage. When hooking a valve in series, always use a power beyond sleeve. Consult your tractor or implement manual to make sure you have the proper quick disconnect line connected to the inlet of the remote valve.

MISAPPLICATION: Always use the proper valve for the job. CONVERTA, CD, CS or CA valves should never be used for metered heavy load lifting - loaders or similar applications. Use an open center valve for open center applications and a closed center valve for closed applications. If in doubt, check with your tractor dealer. Contact CROSS if the valve allows the hydraulic equipment to creep excessively.

MAINTENANCE: Make sure all bolts are tightened and torqued to the recommended specification. Bent or broken parts should not be used. Replace immediately. Always use exact replacements. Always protect valve spool from paint overspray.

Faulty quick disconnects can cause high back pressures and sticking spools. Check quick disconnects periodically to make sure they are functioning properly. If valve spool does not center or appears to stick, do not use!

PUMPS & MOTORS SAFETY:

A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in the technical service manual packed with each unit. Change oil as recommended by your implement or tractor manufacturer.

CYLINDER SAFETY:

Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods caused by binding. Never operate a cylinder above recommended pressures. Never use a cylinder as a safety device when transporting equipment.

PINHOLE LEAKS:

If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!

DESCRIPTION and APPLICATION

The **CLINCHER®** XHT Tong and Backup system is an "open-throat" design which can handle tubulars as small as 2 1/16 inches to as large as 5 1/2 inches in diameter. This system features two (2) jaws in the tong and three (3) jaws in the backup which encircle the pipe. Wrap around jaws and dies, combined with our low friction jaw technology, constant radial load cam system and compensating jaw design provide exceptional gripping capabilities with reduced pipe deformation, stress and marking. Using our non-marking aluminum die system or **GRIT FACE™** dies in the XHT Tong and Backup will now allow stainless steel corrosion resistant alloys (CRA) to be run as quickly and easily as a traditional tong runs conventional steel tubulars.

Notable Features and Benefits

Low Friction Jaws	increases cam angle efficiency to allow use of aluminum dies
Splined Die System	aligns the die with the tubular and more evenly distributes radial load, essentially wrapping the die around the tube reduces pipe stress, deformation and minimizes marking
Constant Cam Angle	insures an adequate radial load is available regardless of relative rotation to enhance performance on undersized pipe
Die Retention Method	provides an enhanced method of preventing equipment damage and die loss if the pipe is inadvertently moved while the tong or backup are still gripping the pipe

In addition to these unique features listed above, the **CLINCHER®** XHT Tong and Backup System is also equipped with numerous standard features including:

Door Interlock	prevents tong ring gear rotation whenever the tong door is open but allows control and operation of backup and lift cylinder at all times
Encoder Adapter	accepts customer's turns encoder to signal to a torque/turn computer
Pressure Control Valve	adjustable pressure control valves allow the customer to limit the amount of pressure applied and torque developed
Tong Handles with Closed Covers	protects operators hands

The features described above are covered by US and foreign patents or pending US and foreign patents.

DESCRIPTION and APPLICATION

TONG APPLICATION

After completing the make-up or break-out cycle, the jaws are opened by reversing the tong motor to drive the ring gear and cam surfaces in the opposite direction until the reversing pin contacts the ring gear shoulder. Springs are used to return the jaws to their fully open position.

BACKUP APPLICATION

The **CLINCHER®** XHT **LOCKJAW™** Backup has an "open throat" design with three jaws that encircle the pipe. The front jaws are operated by cam surfaces on the rear jaw cylinder. During a jaw closing cycle, the front jaws swing in and interlock as the rear die approaches the pipe. Once locked on the pipe, pressure is locked in the backup cylinder by a load holding valve. When opening the backup jaws, the cylinder operation is reversed to retract the rear die and unlock the jaws. Springs move the front jaws to their fully open position.

SPECIFICATIONS

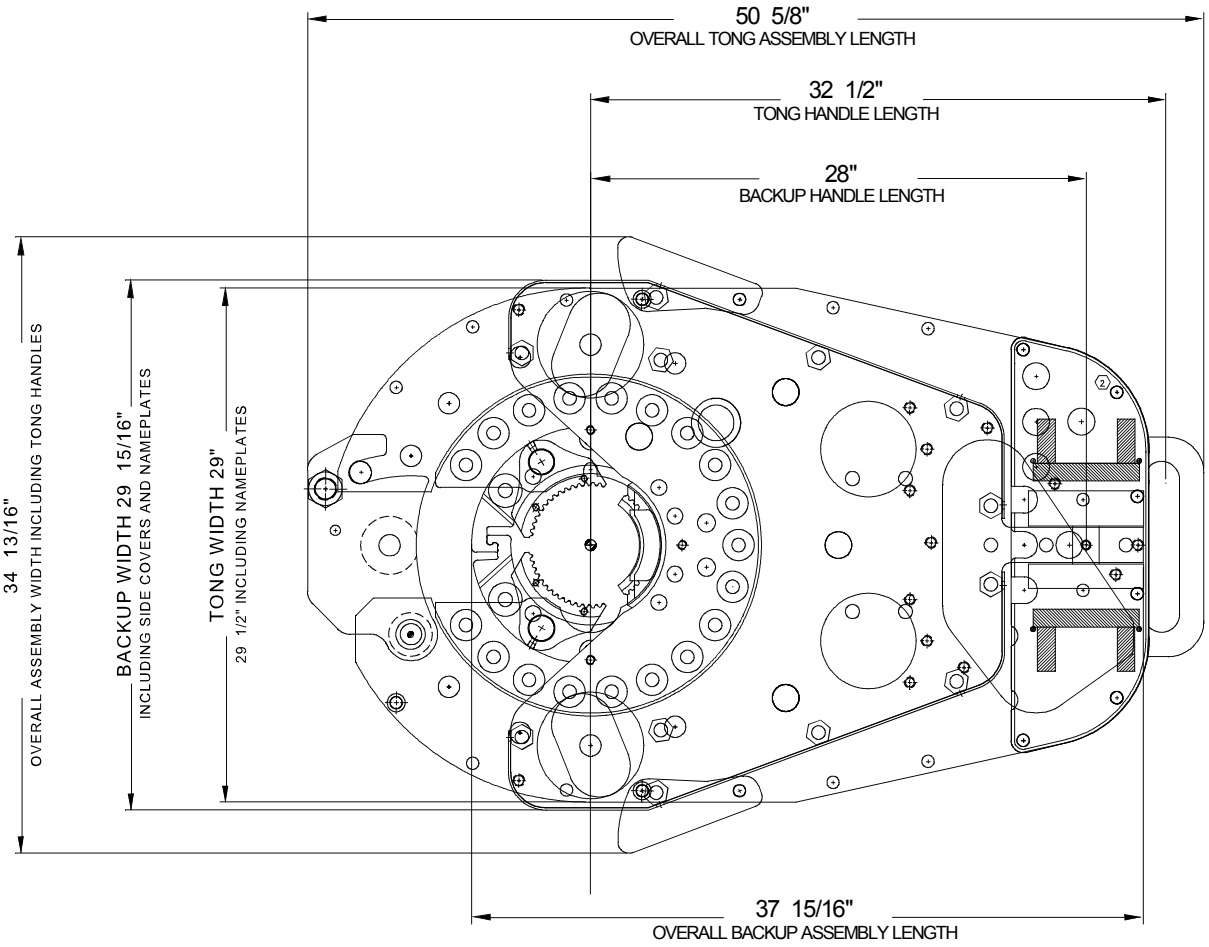
Maximum Torque	40,000 ft.lbs. / 54,233 Nm		
Maximum Operation Pressure	3,000 psi / 207 Bar	Gear	Motor
RPM @ 35 GPM/133 LPM: Manual Gearbox (Two Speed Motor) Max Allowable Flow Rate: 40 GPM/151 LPM (Using Standard A-20 Valve Package) (Max Allowable Flow Rate: 60 GPM/227 LPM Using Optional A-35 Valve Package)	5 RPM @ 40,000 ft lbs	Low	Low
	10 RPM @ 20,000 ft lbs	Low	High
	20 RPM @ 10,000 ft lbs	High	Low
	40 RPM @ 5,000 ft lbs	High	High
Hande Length XHT Tong	32 1/2" / 82.6 cm		
Handle Length **LOCKJAW™** DP Backup	28" / 71.1 cm		
Overall Length XHT Tong & **LOCKJAW™** DP Backup	50 5/8" / 128.6 cm		
Overall Width w/ Handles Overall Width w/o Handles / XHT Tong & LJ DP Backup	34 13/16" / 88.4 cm 29 15/16" / 76.0 cm		
Overall Height w/ **LOCKJAW™** DP Backup & Gauge Mount	57 1/4" / 145.4 cm		
Overall Height w/ **LOCKJAW™** DP Backup & Bail Assem	68 3/4" / 174.6 cm		
Weight Tong (approximate) Weight **LOCKJAW™** DP Backup (approximate) Combined Weight Tong w/ LJ DP Backup (approximate)	2,625 lbs. / 1,193 kg 875 lbs. / 398 kg 3,500 lbs. / 1,590 kg		
Tong Jaw Options	2 1/16" thru 5 1/2" Splined Low Friction(1) 3 1/2" thru 5 1/2" Splined 2 7/8" thru 5 1/2" Dovetail		
1 Backup Jaw Size	2 1/16" thru 5 1/2"		
Gripping Range for Dovetail Tong Jaws (under nominal jaw or adapter sizes)	3/8" / 1.5 cm undersize		
Gripping Range for **LOCKJAW™** DP Backup dressed with Dovetail Adapters	1/4" / 0.6 cm undersize		

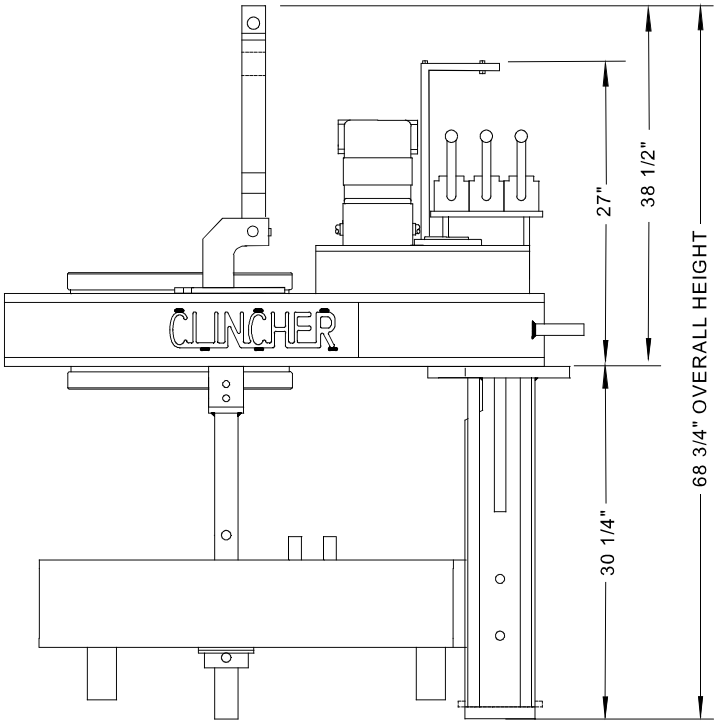
Operates using Dovetail Dies, Steel Tooth Wrap Around Dies, **GRIT FACE™** Wrap Around Dies and Aluminum Wrap Around Dies

(1) Low Friction jaws should not be used at torques exceeding 50% of the maximum tong rating.

Standard Equipment:
Door Interlock

Optional Equipment:
- Handles Tong & Backup
- 3 Point Lifting Bridle
- Electronic Solenoid Dump Valve
- Hydraulic Intensifier for Backup
- Shipping Stand, or Skid
- Varying Outlets for Torque Turns Computer Sending Units





5 1/2" XHT TONG & LOCKJAW™ DRILL PIPE BACKUP DIMENSIONS

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
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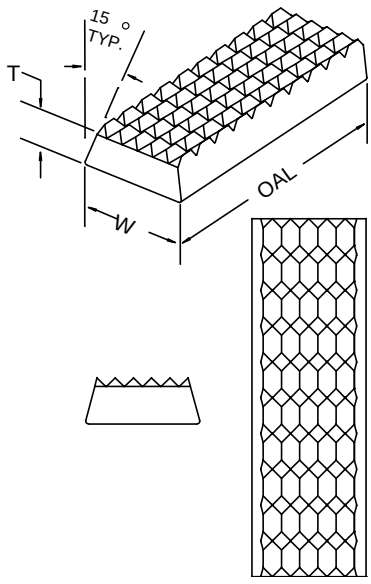
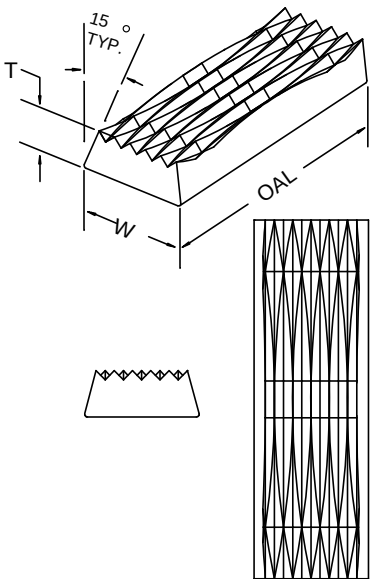
CLINCHER® DIES

Many **CLINCHER®** Tongs and Backups utilize jaws and/or adapters which accept Dovetail Inserts (AKA Pencil Dies or Strip Dies) to effectively grip tubulars. Jaw systems and jaw adapters are also available which accommodate Wrap-Around Fine Tooth Steel Dies, **GRIT FACE™** Dies and Aluminum Dies.

The appropriate jaws, die adapters and dies required for a specific tubular OD are also described in this section of the manual.



STRAIGHT TOOTH



DIAMOND TOOTH

Note: Diamond Tooth Dies are used when a more aggressive bite is required.

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
5/16	5/8	3 1/2	★	★
5/16	5/8	3 7/8	DTI4052	★
5/16	5/8	4 1/2	DTI4002	★
3/8	5/8	3 1/2	DTI4030	★
3/8	5/8	3 7/8	DTI4051	★
3/8	5/8	4 1/2	DTI4001	★

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
17/32	5/8	3 1/2	DTI4031	★
17/32	5/8	3 7/8	DTI4053	★
17/32	5/8	4 1/2	DTI4003	★
5/8	5/8	3 1/2	DTI4032	★
5/8	5/8	3 7/8	DTI4054	★
5/8	5/8	4 1/2	DTI4004	★
11/16	5/8	3 7/8	DTI4055	★
11/16	5/8	4 1/2	DTI4005	★
3/8	1	3 7/8	DTI1505	★
3/8	1 1/4	3 7/8	DTI1614	★
3/8	1 1/4	5	DTI1610	★
7/16	1 1/4	3 7/8	DTI1612	DTI1612D
7/16	1 1/4	5	DTI1617	DTI1617D
1/2	1 1/4	3 7/8	DTI1601	DTI1601D
1/2	1 1/4	5	DTI1602	DTI1602D
9/16	1 1/4	3 7/8	DTI1622	DTI1622D
9/16	1 1/4	5	DTI1623	DTI1623D
5/8	1 1/4	3 7/8	DTI1632	DTI1632D
5/8	1 1/4	5	DTI1633	★
11/16	1 1/4	3 7/8	DTI1642	★
11/16	1 1/4	5	DTI1646	★
3/4	1 1/4	3 7/8	DTI1651	★
3/4	1 1/4	5	DTI1693	★
3/4	1 1/4	5 7/8	DTI1662	DTI1662D
13/16	1 1/4	3 7/8	DTI1661	★
13/16	1 1/4	5	DTI1664	★
7/8	1 1/4	3 7/8	DTI1671	★
7/8	1 1/4	5	DTI1673	★
1	1 1/4	3 7/8	DTI1691	★
1	1 1/4	5	DTI1697	★

★ Available upon request.

CLINCHER® WRAP AROUND DIES

CLINCHER® Wrap Around Dies are available in three types:

Fine Toothed Steel Dies:	for low to ultra high torque applications on carbon steel tubulars including tubing, casing, and drill pipe
Smooth Faced Aluminum Dies:	for low to moderate torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars
GRIT FACE™ Dies:	for low to high torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars where the use of steel dies is prohibited as well as on carbon steel tubulars where reduced marking is desired

CLINCHER® Dies are designed to match the OD of the tubing, casing, coupling, or accessory being made up or broken out. Each die is stamped on the top or side to identify its size. Using Fine Toothed Steel Dies which are slightly larger than the tubular is acceptable provided the difference in diameters is less than 3/32" (0.093"). Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required. **Note:** The use of improperly sized dies can result in reduced torque capacity, increased pipe marking, and reduced die life.

CAUTION: Do not attempt to grip tubular diameters which are larger than the dies being used. Failure to observe this precaution can result in damage to the tubular or tong jaws.

In emergencies where correct die sizes are unavailable, some operators have successfully used two different sizes of dies to accommodate unusual, nonstandard diameters.

CLINCHER® Wrap Around Dies are manufactured in specific diameters to match standard tubing and casing diameters, API coupling diameters, selected work string connection diameters and certain commonly used premium connection coupling diameters. **CLINCHER®** Wrap Around Dies should not be used on tubulars which are larger than the nominal die size. Steel Toothed Dies can be used on tubulars which are no smaller than 3/32" (0.093") less than the nominal die size. Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required.

Note: Fine Toothed Steel Dies are normally stocked in our Broussard, Louisiana facility. A partial listing of commonly manufactured sizes is shown below. Aluminum and **GRIT FACE™** Dies are normally made to order although a limited range of sizes and small quantities may be available from stock. Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.

CLINCHER® WRAP AROUND DIES

DIE Nomenclature for CLE5500 XHT Tong and BUCD5500 LOCKJAW™ Drill Pipe Backup

CLJ5501-xxxx	Fine Toothed Steel dies for jaws (2 reqd per tong)
BUC5500-xxxx	Fine Toothed Steel dies for jaws (3 reqd per backup)
BUCX5500-xxxx	Coarse Tooth Steel dies for jaws (3 reqd per backup)
N/A	Aluminum dies for jaws (2 reqd per tong)
N/A	Aluminum dies for Low Friction jaws (2 reqd per tong)
BUCA5500-xxxx	Aluminum dies for jaws (3 reqd per backup)
BB5601-xxxx	**GRIT FACE™** dies for jaws (2 reqd per tong)
BB5700-xxxx	**GRIT FACE™** dies for jaws (3 reqd per backup)
BBT5700-xxxx	**GRIT FACE™** dies w/teeth for jaws (2 reqd per tong, 3 reqd per backup)

ORDERING EXAMPLE: fine toothed steel dies are needed to run 2 7/8" OD tubing
Qty. two (2) CLJ5501-2875 dies for jaws
Qty. three (3) BUC5500-2875 dies for jaws
(replace xxxx with size required in inches)

CLJ5501-xxxx: Fine Toothed steel dies for XHT Tong

1.660	1.900	2.062	2.125	2.313	2.375	2.400	2.600	2.697	2.723	2.750	2.875	2.900
3.000	3.062	3.125	3.210	3.250	3.297	3.375	3.460	3.500	3.625	3.668	3.700	3.750
3.875	3.900	3915	4.000	4.043	4.053	4.125	4.250	4.325	4.330	4.375	4.400	4.500
4.625	4.750	4.875	4.892	4.900	4.921	4.961	5.000	5.062	5.125	5.180	5.250	5.300
5.375	5.400	5.500	5.669									

BUC5500-xxxx: Fine Toothed steel dies for XHT Backup

1.750	2.062	2.375	2.697	2.700	2.707	2.723	2.793	2.875	3.000	3.062	3.125	3.220
3.230	3.240	3.250	3.297	3.337	3.375	3.437	3.500	3.625	3.668	3.687	3.750	3.830
3.868	3.875	3.878	3.900	4.000	4.053	4.125	4.200	4.250	4.312	4.375	4.500	4.562
4.625	4.687	4.750	4.812	4.875	4.900	4.961	5.000	5.062	5.125	5.200	5.250	5.375
5.500	5.563	6.050										

BUCX5500-xxxx: Coarse Tooth steel dies for XHT Backup

5.500

BUCA5500-xxxx: Aluminum dies for XHT Backup

2.375	2.625	2.697	2.723	2.875	3.000	3.125	3.220	3.230	3.250	3.295	3.297	3.327
3.354	3.397	3.415	3.500	3.668	3.700	3.733	3.750	3.830	3.875	3.878	3.890	3.910
3.915	3.950	4.000	4.025	4.053	4.055	4.060	4.069	4.100	4.125	4.200	4.250	4.313
4.320	4.450	4.500	4.606	4.625	4.750	4.850	4.862	4.875	4.882	4.920	4.950	5.000
5.016	5.030	5.063	5.125	5.160	5.200	5.250	5.413	5.500	5.550	5.563	5.650	6.050

CLINCHER® WRAP AROUND DIES

BB5601-xxxx: **GRIT FACE™** dies for XHT Tong

2.062	2.375	2.600	2.697	2.723	2.750	2.875	2.900	3.000	3.062	3.125	3.187	3.230
3.250	3.277	3.297	3.320	3.375	3.500	3.625	3.668	3.750	3.875	3.878	3.890	3.915
3.961	4.000	4.043	4.053	4.062	4.125	4.185	4.250	4.313	4.350	4.400	4.500	4.580
4.625	4.720	4.750	4.770	4.875	4.900	5.000	5.180	5.200	5.250	5.300	5.313	5.500

BB5700-xxxx: **GRIT FACE™** dies for XHT Backup

2.230	2.375	2.697	2.723	2.875	3.125	3.250	3.297	3.337	3.375	3.500	3.625	3.687
3.878	3.900	4.000	4.053	4.055	4.069	4.125	4.250	4.378	4.450	4.500	4.682	4.750
4.950	5.000	5.005	5.016	5.142	5.160	5.500	5.736	6.050	6.075			

BBT5700-xxxx: **GRIT FACE™** dies w/teeth for XHT Backup

3.500	4.000	4.125	4.250	4.500

Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.

BUCD5500 5 1/2" LOCKJAW™ BACKUP FOR DRILL PIPE

The BUCD5500 **LOCKJAW™** Backup is a dual purpose tool intended for use on drill pipe and OCTG tubular goods. This operational flexibility is achieved through a combination of a "long stroke" rear clamping cylinder, compensating front jaws and dovetail die adapters or wrap around dies.

When used in the drill pipe mode with pipe larger than 5 1/4" OD up to 5 1/2" OD, wrap around dies must be used. The maximum dovetail die adapter can be as large as 5 1/4" in diameter. When used with dovetail die adapters and strip dies, the BUCD5500 can be used on tool joints which are as much as 1/4" smaller than the nominal size of the dovetail die adapter. The dovetail die adapters have been specially modified to insure adequate clearance exists between the die adapter in the clamping cylinder and the die adapter in the front jaws even when the "long stroke" capability of the clamping cylinder is extended to clamp on undersized pipe. The compensating front jaws are spring loaded and capable of moving to insure proper contact with undersized tool joints when dovetail die adapters are used. Note: Wrap around dies are not intended for use with undersized tubulars. The dovetail die adapters used with the BUCD5500 **LOCKJAW™** Backup for Drill Pipe can be readily identified by their part number:

BUDT55-XXXX where XXXX equals the nominal size
For example, if XXXX is 0500 this adapter is set up for 5.00" OD tool joints.

The splines used to hold the dovetail die adapter in the jaw is the same diameter as the splines used on BUC5500 **CLINCHER®** 5 1/2" UHT Backups and Dies. However, the dovetail die adapters used with the BUCD5500 **LOCKJAW™** Backup for Drill Pipe have 15 teeth on their OD compared to the 17 teeth on the OD of the BUC5500 UHT dies.

DIE INSTALLATION PROCEDURES (REFER TO ILLUSTRATION)

The "long stroke" cylinder in this tool must **not** be fully extended when changing dies to avoid interference with dies in the compensating front jaws. The following procedures are recommended for changing dies. Slowly close BUCD5500 **LOCKJAW™** until jaws are fully latched but do not allow rear clamping cylinder to extend out anymore than is required to remove the top die retaining clip. Shut off power unit, bleed off all trapped pressures and disconnect supply and return hoses.

WARNING: Failure to shut off power unit, bleed off trapped pressure and disconnect supply and return hoses may expose personnel to moving parts which will cause serious injury or death.

CAUTION: Fully closing the LOCKJAW™ Backup without correct sized dies and tubulars in place will result in equipment damage.

BUCD5500 5 1/2" LOCKJAW™ BACKUP FOR DRILL PIPE

When installing BUDT55-XXXX dovetail die adapters and BUC5500-XXXX wrap around dies it is critical the dies or die adapters used in the front compensating jaws be installed so that their front edge is flush with the edge of the compensating jaw closest to the "**LOCKJAW™** door hooks". The back edge of the dovetail die adapter will line up with the edge of the compensating jaw furthest away from the "**LOCKJAW™** door hooks". When wrap around dies are installed, the back edge of the die will extend beyond the edge of the compensating jaw which is furthest away from the "**LOCKJAW™** door hooks". The difference between these two die systems is the clearance required when the dovetail die adapter is used with undersized tool joints.

Remove upper clip bolts, upper clip and die from rear clamping jaw. Install appropriate wrap around die or dovetail die adapter. Rear die should be centered in rear jaw. Reinstall upper clip and clip bolts. Lubricate clip bolts with Never-Seez or equivalent. Tighten bolts securely to approximately 38 ft lbs.

Remove upper clip bolts, upper clips and dies from compensating front jaws. Install appropriate wrap around die or dovetail die adapter. Reinstall upper clips and clip bolts. Lubricate clip bolts with Never-Seez or equivalent. Tighten bolts securely to approximately 38 ft lbs.

Reconnect supply and return hoses. Restart power unit. Fully open backup and tubular with OD compatible with dies. Close backup and clamp on pipe. Visually confirm door is fully closed and locked and that all dies are gripping uniformly.

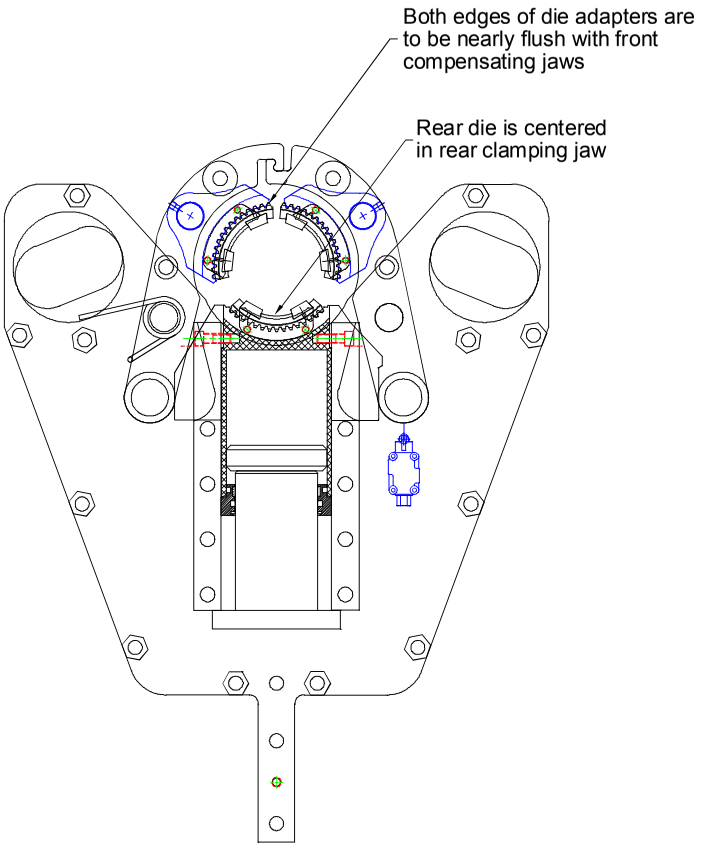
DIES, DIE RETAINERS AND DIE RETAINER CLIPS

The BUCD5500 **LOCKJAW™** Backup for Drill Pipe is a versatile tool which can be used on drill pipe and OCTG tubular goods. It accepts dovetail die adapters (BUDT55-XXXX 2 3/8" thru 5 1/4") (BUCX55005500 5 1/2") described above, wrap around fine tooth steel dies (BUC5500-XXXX), wrap around **GRIT FACE™** dies (BB5700-XXXX) or wrap around aluminum dies (BUCA5500-XXXX).

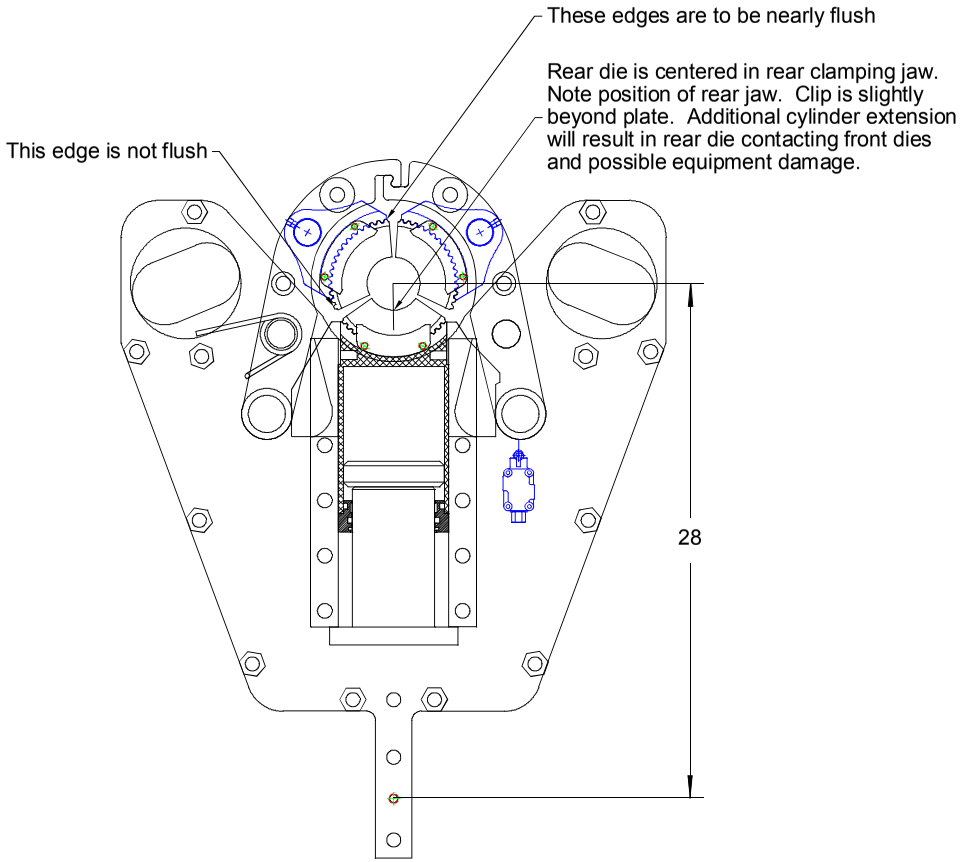
Special consideration must be given to insure the proper clips are used to insure proper die retention. The difference between the clips is the minor diameter and the thickness of the retaining lip. The BUCD5514 has an inner radius of 2.865" and a lip thickness of 0.200". The BUCD5531 has an inner radius of 2.780" and a lip thickness of 0.285".

Die or Die Adapter Series	Lower Clip Part Number	Upper Clip Part Number
wrap around dies 5 1/2" to 5"	BUCD5514	BUCD5514
all wrap around dies smaller than 5"	BUCD5514 or BUCD5531	BUCD5514 or BUCD5531
dovetail die adapters 5 1/4"	BUCD5514	BUCD5514
dovetail die adapters 5 1/4 " to 4 3/4"	BUCD5514 or BUCD5531	BUCD5531
all dovetail die adapters smaller than 4 3/4"	BUCD5514 or BUCD5531	BUCD5514 or BUCD5531

BUCD5500 **CLINCHER®** 5 1/2" **LOCKJAW™** Backup dressed with dovetail die adapters and strip dies for 4 3/4" drillpipe



BUCD5500 **CLINCHER®** 5 1/2" **LOCKJAW™** Backup dressed with wrap around dies for 2 7/8" tubing


These edges are to be nearly flush
Rear die is centered in rear clamping jaw. Note position of rear jaw. Clip is slightly beyond plate. Additional cylinder extension will result in rear die contacting front dies and possible equipment damage.
This edge is not flush
28

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1			

1/8 LS STAMP P/N & W.O ON NON-CRITICAL SURFACE

ETCH P/N & W.O ON NON-CRITICAL SURFACE

TAG P/N & W.O

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — R6

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

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1 =Revision No. X =STAMP,ETCH,TAG =Machine Zero

1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 1

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD,LA 70518
(318)837-8847

PART NAME: use of die adapters and dies in BUCD5500 **LOCKJAW™** Backup

PART #:illustration

DRAWN BY:

APPROVED BY: DAN B

CHK BY: DB DATE: 11/22/99

REF: F:\Mark\BUCD5500\assembly.DWG

MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

Alternate Matl:

H.T Instructions: Case Depth:

P:\Manuals\Equip Manuals\Dwgs\BUCD5500 Die Adapter Illustration rev1.wpg 05/18/07

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Gripping range, jaws, and dovetail die inserts for CLINCHER® 5 1/2 XHT Tong

Nominal Dovetail Tong Jaw and Dovetail Die Adapter Size	Tong Jaw Assembly Part Number	dovetail tong jaw part number	tong jaw roller part number	tong jaw pin part number	nominal dovetail jaw & adapter size	Dovetail tong jaw and dovetail backup adapter diametrical gripping range (OD in inches) when dressed with1 1/4" wide 3 7/8" long dovetail strip dies with thickness of:									
						1	0.875	0.8125	0.75	0.6875	0.625	0.5625	**0.5**	0.4375	<<dovetail die thickness
	assembly consists of two jaws c/w pins, rollers, dovetail dies and die retainers	*two pcs reqd per set*	*two pcs reqd per set*	*two pcs reqd per set*		*undersized (use this size for emergencies only)*	*undersized (use this size for emergencies only)*	*undersized (use this size for emergencies only)*	*undersized*	*undersized*	*undersized*	*undersized*	***STANDARD***	*oversized (use this size for emergencies only)*	<<pipe application
5 1/2 x 2 7/8	CJDT59-2875	59075	59027-01	59028-01	2.875	1.875	2.125	2.250	2.375	2.500	2.625	2.750	**2.875**	3.000	maximum pipe OD for die & jaw
						1.500	*1.750*	*1.875*	*2.000*	*2.125*	*2.250*	*2.375*	***2.500***	*2.625*	*minimum undersized condition*
5 1/2 x 3 1/8	CJDT59-3125	59029	59027-01	59028-01	3.125	2.125	2.375	2.500	2.625	2.750	2.875	3.000	**3.125**	3.250	maximum pipe OD for die & jaw
						1.750	*2.000*	*2.125*	*2.250*	*2.375*	*2.500*	*2.625*	***2.750***	*2.875*	*minimum undersized condition*
5 1/2 x 3 3/8	CJDT59-3375	59069	59027-01	59028-01	3.375	2.375	2.625	2.750	2.875	3.000	3.125	3.250	**3.375**	3.500	maximum pipe OD for die & jaw
						2.000	*2.250*	*2.375*	*2.500*	*2.625*	*2.750*	*2.875*	***3.000***	*3.125*	*minimum undersized condition*
5 1/2 x 3 1/2	CJDT59-XXXX	59XXX	59027	59028	3.500	2.500	2.750	2.875	3.000	3.125	3.250	3.375	**3.500**	3.625	maximum pipe OD for die & jaw
						2.125	*2.375*	*2.500*	*2.625*	*2.750*	*2.875*	*3.000*	***3.125***	*3.250*	*minimum undersized condition*
5 1/2 x 4	CJDT59-4000	59070	59027	59028	4.000	3.000	3.250	3.375	3.500	3.625	3.750	3.875	**4.000**	4.125	maximum pipe OD for die & jaw
						2.625	*2.875*	*3.000*	*3.125*	*3.250*	*3.375*	*3.500*	***3.625***	*3.750*	*minimum undersized condition*
5 1/2 x 4 1/8	CJDT59-4125	59030	59027	59028	4.125	3.125	3.375	3.500	3.625	3.750	3.875	4.000	**4.125**	4.250	maximum pipe OD for die & jaw
						2.750	*3.000*	*3.125*	*3.250*	*3.375*	*3.500*	*3.625*	***3.750***	*3.875*	*minimum undersized condition*
5 1/2 x 4 1/4	CJDT59-XXXX	59XXX	59027	58028	4.250	3.250	3.500	3.625	3.750	3.875	4.000	4.125	**4.250**	4.375	maximum pipe OD for die & jaw
						2.875	*3.125*	*3.250*	*3.375*	*3.500*	*3.625*	*3.750*	***3.875***	*4.000*	*minimum undersized condition*
5 1/2 x 4 1/2	CJDT59-4500	59071	59027	59028	4.500	3.500	3.750	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625	maximum pipe OD for die & jaw
						3.125	*3.375*	*3.500*	*3.625*	*3.750*	*3.875*	*4.000*	***4.125***	*4.250*	*minimum undersized condition*
5 1/2 x 4 3/4	CJDT59-4750	59076	59027	59028	4.750	3.750	4.000	4.125	4.250	4.375	4.500	4.625	**4.750**	4.875	maximum pipe OD for die & jaw
						3.375	*3.625*	*3.750*	*3.875*	*4.000*	*4.125*	*4.250*	***4.375***	*4.500*	*minimum undersized condition*
5 1/2 x 4 7/8	CJDT59-4875	59031	59027	59028	4.875	3.875	4.125	4.250	4.375	4.500	4.625	4.750	**4.875**	5.000	maximum pipe OD for die & jaw
						3.500	*3.750*	*3.875*	*4.000*	*4.125*	*4.250*	*4.375*	***4.500***	*4.625*	*minimum undersized condition*
5 1/2 x 5	CJDT59-5000	59072	59027	59028	5.000	4.000	4.250	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125	maximum pipe OD for die & jaw
						3.625	*3.875*	*4.000*	*4.125*	*4.250*	*4.375*	*4.500*	***4.625***	*4.750*	*minimum undersized condition*
5 1/2 x 5 1/4	CJDT59-5250	59032	59027	59028	5.250	4.250	4.500	4.625	4.750	4.875	5.000	5.125	**5.250**	5.375	maximum pipe OD for die & jaw
						3.875	*4.125*	*4.250*	*4.375*	*4.500*	*4.625*	*4.750*	***4.875***	*5.000*	*minimum undersized condition*
5 1/2 x 5 1/2	CJDT59-5500	59073	59027	59028	5.500	4.500	4.750	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625	maximum pipe OD for die & jaw
						4.125	*4.375*	*4.500*	*4.625*	*4.750*	*4.875*	*5.000*	***5.125***	*5.250*	*minimum undersized condition*
Note: XXXX indicates this size has not been designed at this time, but is available upon request.															
*REPLACEMENT DOVETAIL INSERTS for JAWS AND DIE ADAPTERS - **CLINCHER®** part number for 1 1/4" wide x 3 7/8" long straight toothed dovetail die inserts used in dovetail jaws (4 pcs required per jaw or 8 pcs required per jaw set and dovetail die adapters (4 pcs)*						DTI1691	DTI1671	DTI1661	DTI1651	DTI1642	DTI1632	DTI1622	**DTI1601**	DTI1612	
*REPLACEMENT DOVETAIL INSERTS for JAWS AND DIE ADAPTERS - **CLINCHER®** part number for 1 1/4" wide x 3 7/8" long diamond toothed dovetail die inserts used in dovetail jaws (4 pcs required per jaw or 8 pcs required per jaw set and dovetail die adapters (4 pcs)*						upon request	upon request	upon request	upon request	upon request	DTI1632D	DTI1622D	**DTI1601D**	DTI1612D	

Gripping range, adapters and dovetail die inserts for CLINCHER® 5 1/2 LOCKJAW™ Backup for Drillpipe

Nominal Dovetail Tong Jaw and Dovetail Die Adapter Size	backup dovetail die adapter part number	nominal dovetail jaw & adapter size	Dovetail tong jaw and dovetail backup adapter diametrical gripping range (OD in inches) when dressed with1 1/4" wide 3 7/8" long dovetail strip dies with thickness of:									
			1	0.875	0.8125	0.75	0.6875	0.625	0.5625	**0.5**	0.4375	<<dovetail die thickness
	3 dovetail die adapters required to dress backup		*undersized (use this size for emergencies only)*	*undersized (use this size for emergencies only)*	*undersized (use this size for emergencies only)*	*undersized*	*undersized*	*undersized*	*undersized*	***STANDARD***	*oversized (use this size for emergencies only)*	<<pipe application
5 1/2 x 2 7/8	BUDT55-02875	2.875	1.875	2.125	2.250	2.375	2.500	2.625	2.750	**2.875**	3.000	maximum pipe OD for die & jaw
			1.625	*1.875*	*2.000*	*2.125*	*2.250*	*2.375*	*2.500*	***2.625***	*2.750*	*minimum undersized condition*
5 1/2 x 3 1/8	BUDT55-03125	3.125	2.125	2.375	2.500	2.625	2.750	2.875	3.000	**3.125**	3.250	maximum pipe OD for die & jaw
			1.875	*2.125*	*2.250*	*2.375*	*2.500*	*2.625*	*2.750*	***2.875***	*3.000*	*minimum undersized condition*
5 1/2 x 3 3/8	BUDT55-03375	3.375	2.375	2.625	2.750	2.875	3.000	3.125	3.250	**3.375**	3.500	maximum pipe OD for die & jaw
			2.125	*2.375*	*2.500*	*2.625*	*2.750*	*2.875*	*3.000*	***3.125***	*3.250*	*minimum undersized condition*
5 1/2 x 3 1/2	BUDT55-03500	3.500	2.500	2.750	2.875	3.000	3.125	3.250	3.375	**3.500**	3.625	maximum pipe OD for die & jaw
			2.250	*2.500*	*2.625*	*2.750*	*2.875*	*3.000*	*3.125*	***3.250***	*3.375*	*minimum undersized condition*
5 1/2 x 4	BUDT55-04000	4.000	3.000	3.250	3.375	3.500	3.625	3.750	3.875	**4.000**	4.125	maximum pipe OD for die & jaw
			2.750	*3.000*	*3.125*	*3.250*	*3.375*	*3.500*	*3.625*	***3.750***	*3.875*	*minimum undersized condition*
5 1/2 x 4 1/8	BUDT55-04125	4.125	3.125	3.375	3.500	3.625	3.750	3.875	4.000	**4.125**	4.250	maximum pipe OD for die & jaw
			2.875	*3.125*	*3.250*	*3.375*	*3.500*	*3.625*	*3.750*	***3.875***	*4.000*	*minimum undersized condition*
5 1/2 x 4 1/4	BUDT55-04250	4.250	3.250	3.500	3.625	3.750	3.875	4.000	4.125	**4.250**	4.375	maximum pipe OD for die & jaw
			3.000	*3.250*	*3.375*	*3.500*	*3.625*	*3.750*	*3.875*	***4.000***	*4.125*	*minimum undersized condition*
5 1/2 x 4 1/2	BUDT55-04500	4.500	3.500	3.750	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625	maximum pipe OD for die & jaw
			3.250	*3.500*	*3.625*	*3.750*	*3.875*	*4.000*	*4.125*	***4.250***	*4.375*	*minimum undersized condition*
5 1/2 x 4 3/4	BUDT55-04750	4.750	3.750	4.000	4.125	4.250	4.375	4.500	4.625	**4.750**	4.875	maximum pipe OD for die & jaw
			3.500	*3.750*	*3.875*	*4.000*	*4.125*	*4.250*	*4.375*	***4.500***	*4.625*	*minimum undersized condition*
5 1/2 x 4 7/8	BUDT55-04875	4.875	3.875	4.125	4.250	4.375	4.500	4.625	4.750	**4.875**	5.000	maximum pipe OD for die & jaw
			3.625	*3.875*	*4.000*	*4.125*	*4.250*	*4.375*	*4.500*	***4.625***	*4.750*	*minimum undersized condition*
5 1/2 x 5	BUDT55-05000	5.000	4.000	4.250	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125	maximum pipe OD for die & jaw
			3.750	*4.000*	*4.125*	*4.250*	*4.375*	*4.500*	*4.625*	***4.750***	*4.875*	*minimum undersized condition*
5 1/2 x 5 1/4	BUDT55-05250	5.250	4.250	4.500	4.625	4.750	4.875	5.000	5.125	**5.250**	5.375	maximum pipe OD for die & jaw
			4.000	*4.250*	*4.375*	*4.500*	*4.625*	*4.750*	*4.875*	***5.000***	*5.125*	*minimum undersized condition*
5 1/2 x 5 1/2	BUCX55005500	5.500	4.500	4.750	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625	maximum pipe OD for die & jaw
			4.250	*4.500*	*4.625*	*4.750*	*4.875*	*5.000*	*5.125*	***5.250***	*5.375*	*minimum undersized condition*
Note: XXXXX indicates this size has not been designed at this time, but is available upon request.												
*REPLACEMENT DOVETAIL INSERTS for JAWS AND DIE ADAPTERS - **CLINCHER**® part number for 1 1/4" wide x 3 7/8" long straight toothed dovetail die inserts used in dovetail jaws (4 pcs required per jaw or 8 pcs required per jaw set and dovetail die adapters (4 pcs)*			DTI1691	DTI1671	DTI1661	DTI1651	DTI1642	DTI1632	DTI1622	**DTI1601**	DTI1612	
*REPLACEMENT DOVETAIL INSERTS for JAWS AND DIE ADAPTERS - **CLINCHER**® part number for 1 1/4" wide x 3 7/8" long diamond toothed dovetail die inserts used in dovetail jaws (4 pcs required per jaw or 8 pcs required per jaw set and dovetail die adapters (4 pcs)*			upon request	upon request	upon request	upon request	upon request	DTI1632D	DTI1622D	**DTI1601D**	DTI1612D	

Splined jaws and splined wraparound dies for CLINCHER® 5 1/2 XHT Tong for tubing and casing

Nominal tong jaw size	Splined Jaw Assembly Number *assembly consists of two jaws c/w pins, rollers, clips and clip bolts*	splined jaw part number *two pcs reqd per set*	splined jaw roller part number *two pcs reqd per set*	splined jaw pin part number *two pcs reqd per set*	top clip part number for tong jaws *four pcs reqd per set*	bottom clip part number for tong jaws *four pcs reqd per set*	available wraparound die series (two dies are required to dress tong jaws and three dies are required to dress backup for a total of five dies per tool - excludes any dies required for couplings)		
							fine tooth steel dies for tong	**GRIT FACE™** dies for tong	non-marking aluminum dies for tong
5 1/2 x 3 1/2 - 5 1/2	CJ-59B	59074	59027	59028	59107	59108	CLJ5501-nnnnn	BB5601-nnnnn	N/A
5 1/2 x 2 7/8 - 5 1/2	CJ-LF-59B	59074-01	59027-01	59028-01	59107	59108	CLJ5501-nnnnn	BB5601-nnnnn	N/A

-nnnnn indicates size designated by replacing "nnnnn" sequence with size required (in inches) to three decimal places; i.e., 4.500 for 4 1/2" OD casing.

Wrap Around Dies for BUC5500 5 1/2 UHT Backup and BUCD5500 5 1/2 LOCKJAW™ DP Backup for tubing and casing

fine tooth steel dies for backup	**GRIT FACE™** dies for backup	non-marking aluminum dies for backup
BUC5500-nnnnn	BB5700-nnnnn	BUCA5500-nnnnn
BUC5500-nnnnn	BB5700-nnnnn	BUCA5500-nnnnn
BUC5500-nnnnn	BB5700-nnnnn	BUCA5500-nnnnn

-nnnnn indicates size designated by replacing "nnnnn" sequence with size required (in inches) to three decimal places; i.e., 4.500 for 4 1/2" OD casing.

Note: **CLINCHER®** wraparound dies are machined to specific casing, tubing, coupling or accessory diameter. Additional dies must be orderd to match specific coupling diameters associated with accessories or special clearance premium tubular connections.

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ASSEMBLY INSTRUCTIONS

Fastener Lubrication and Make Up Torque Requirements

Most bolts, nuts and other threaded components are to be lubricated with Never-Seez or equivalent before assembly. Certain fasteners are to be assembled using permanent or removable Loctite as indicated in the assembly instructions and drawings. All tapered pipe threads are to be treated with a Teflon based pipe dope to assist in makeup and prevent leakage.

CAUTION: Do not use Teflon tape. Improper application of Teflon tape can cause joint failures. Teflon tape can release large particles which can plug small passages in hydraulic equipment.

All standard fasteners used in **CLINCHER®** products are to be GRADE 8 or better. DO NOT SUBSTITUTE lessor grades of fasteners. All fasteners are to be made up to the torque charted below. Failure to properly assemble these fasteners can result in their loss, product malfunction and ultimately result in situations where personnel can be exposed to dangerous situations.

XHT TONG and LOCKJAW™ BACKUP FASTENERS		
Size	***Application***	***Torque***
1/4 - 20 NC	door switch mounting bolts, tong clip bolts	14 ft lbs
3/8 - 16 Set Screws	bearing caps, door switch adj. sleeve	* [1]
3/8 - 16 NC	housing cover, idler race, smart gear top bearing cap, backup side plates, tong & backup clip bolts	38 ft lbs
1/2- 13 NC	brake bands, cage plate key, ring gear key, smart gear, motor mounts, backup cyl. wedges, leg bolts	93 ft lbs
5/8 - 11 NC	housing cover, tong plates, bearing caps, backup cyl. gland bolts, hanger bolts	180 ft lbs
3/4 - 16 NF	cam follower nuts	52 ft lbs
3/4 - 10 NC	LJ DP backup plates & doors	317 ft lbs
7/8 - 9 NC	cage plate bolts	473 ft lbs
1 - 12 NF	dumbell roller	* [2]
1 1/4 - 12 NF	backup bulkhead connector	100 ft lbs
1 1/2 - 12 NF	idler shaft	1,200 ft lbs

[*1] Bearing Caps: Coat with removable Loctite, tighten until screw contacts bearing, back off 1 turn. Door Switch Adj. Sleeve: Coat with removable Loctite, tighten by hand until snug.

[*2] Tighten until all slack is removed, but dumbell roller is still free to rotate by hand.

ASSEMBLY INSTRUCTIONS

LUBRICATION STANDARDS

Bearings and gears must be lubricated to minimize friction, cool, exclude foreign matter and prevent corrosion. **CLINCHER®** recommends using Texaco Marfak MP 2 or equivalent for all grease zerts, roller bearings and bushings. Gears located within the clutch housing or between the tong plates are to be heavily lubricated using PLUSCO 855 or equivalent.

OPERATIONAL INSTRUCTIONS

SUSPENSION

A) Tong should be hung by a 7/8" IWRC minimum O.D. wire cable with a 31 ton minimum breaking strength. It should be hung as close to the center of the drill rotary without interfering with operation of drill string and lifting equipment. It is recommended the operator make use of the **CLINCHER®** Lift Cylinder. The **CLINCHER®** Lift Cylinder incorporates a hydraulic cylinder and manual lift spring. The hydraulic cylinder portion is used to assist in the raising and lowering of the tong and backup while the spring allows for movement during make-up and break-out.

   WARNING: The suspension system must allow the tong to easily move down a distance equivalent to the thread make-up length. If significant resistance is encountered the suspension system may be subject to load which could cause its failure, damage equipment, or expose personnel to severe or fatal hazards.

B) Assure that tong is suspended in level manner. Both tong and the backup must be level at the point they contact the tubular. Using adjustment screws and slots in rigid hanger assembly, adjust tong so that it hangs level on horizontal axis and is parallel to tubular on vertical axis.

C) Make certain that floor space is adequate to maneuver tong on and off pipe. The space must be clear of obstructions to allow safe and unrestricted operation.

D) Attach 1 1/2" IWRC minimum wire cable with a 114 ton minimum breaking strength or better, as a tong back up line at 90 degree angle to tong and at same level to insure proper readout of torque indicator. You should always have snubbing line attached. Use of a integral hydraulic backup is safer than manual backup, but operators should maintain additional safety of snubbing line to prevent injury in case of hydraulic failure or the failure of operator to have backup properly applied to tubular. This equipment generates extreme torque and should be used with caution.

Jaw and Die Installation

A) Be sure all power to unit is off and power unit itself is shut down.

B) Determine O.D. of tubular to be made-up or broken-out. Use proper dies to bite O.D. of tubular and insert as follows: Remove sliding head jaws (2) from cage plate pockets. Insert one jaw with proper dies into pocket assuring the jaw roller pin faces upward. Repeat procedure for other side.

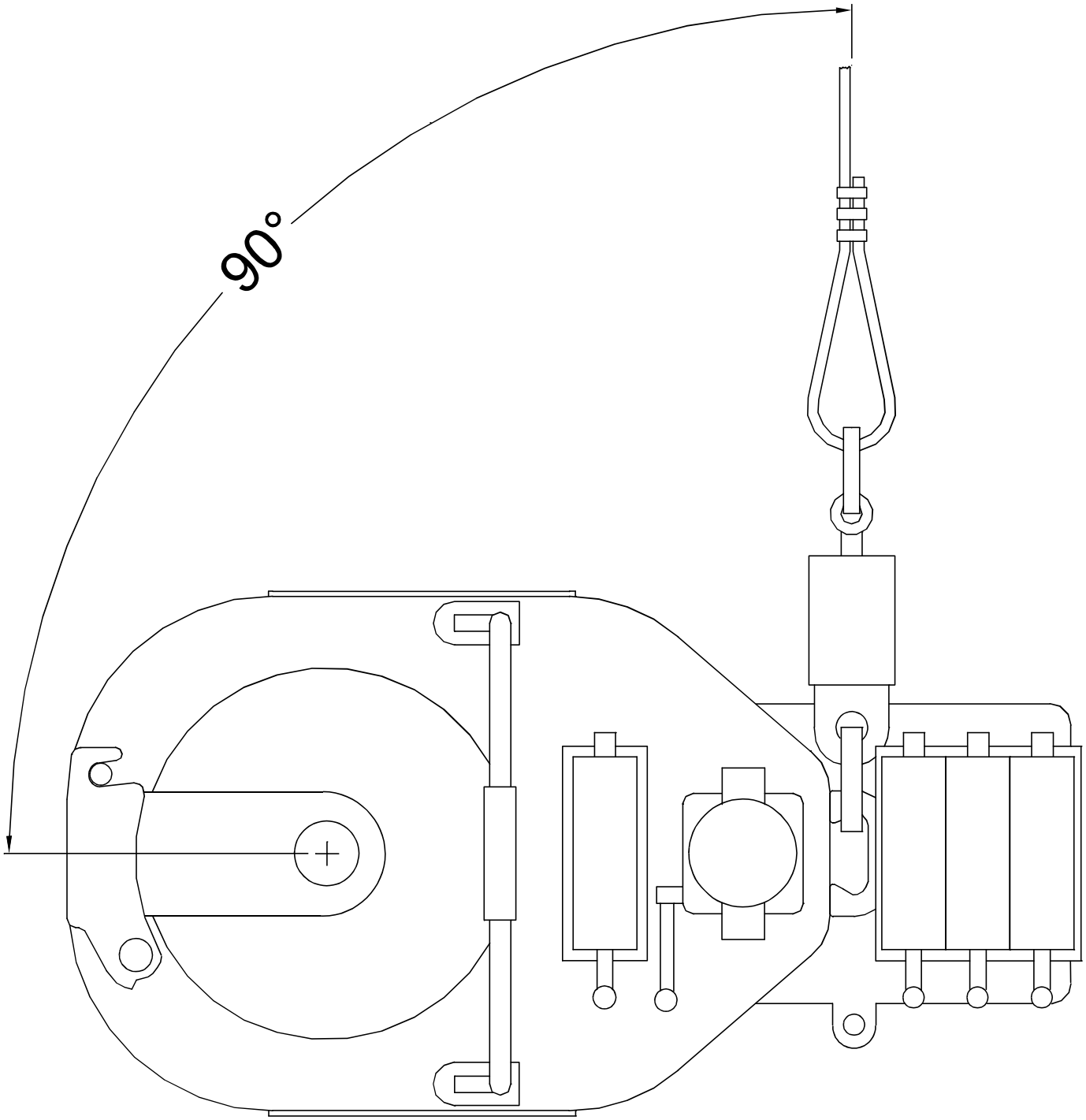
OPERATIONAL INSTRUCTIONS

Hydraulic Lines

A) Be sure all power to unit is off and power unit itself is shut down.

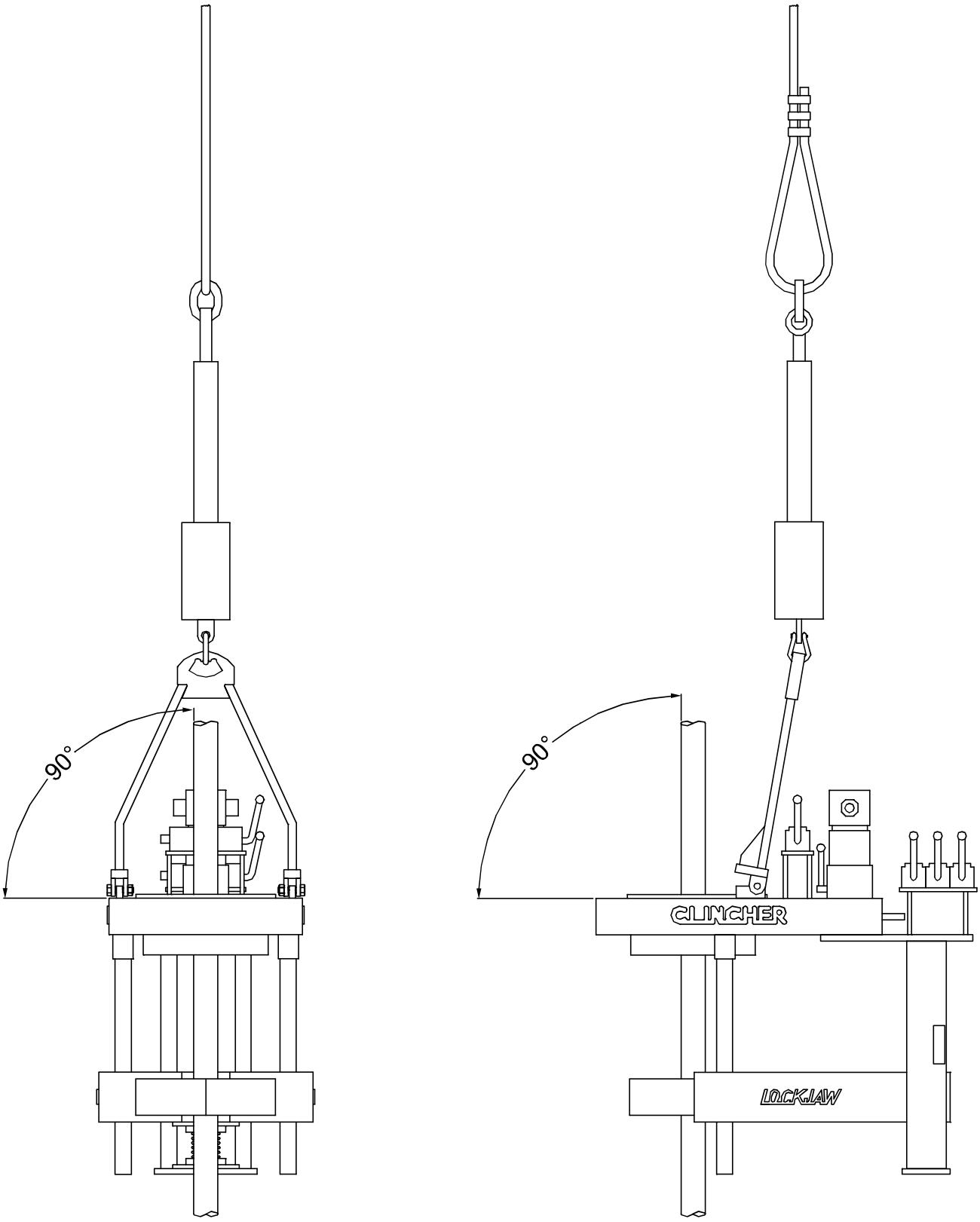
B) Always inspect hoses prior to installation for abrasions, kinks, and other visible damage.

C) Install hydraulic supply hose and hydraulic return hose between tong and hydraulic power unit. Be advised that the standard installation on **CLINCHER®** tong calls for 1" Hydraulic Supply hose and 1-1/4" Hydraulic Return hose. The differing hoses eliminates the possibility attaching the wrong hose to the wrong outlet while at the same time reducing back pressure in your hydraulic system.



TYPICAL SNUB LINE INSTALLATION

NOTE: SNUB LINE IS PERPENDICULAR
TO AXIS OF TONG



TYPICAL TONG INSTALLATION

NOTE: TONG IS PERPENDICULAR
TO TUBING

OPERATIONAL INSTRUCTIONS

Tong Operation

A. Insure proper dies are installed. Connect hydraulic hoses, verify reservoir is full of hydraulic fluid and insure suction valve is open.

B. Open bypass valve to hydraulic system, then check to make sure all hose connections are secure and hydraulic system is free of leaks.

C. Be certain door is completely closed before operation to insure safe operation. The **CLINCHER®** CLE5500XHT is equipped with a door switch, which prevents operation of the tong when door is even partially open.

D. Use power unit to start up procedure as outlined in your owners manual supplied by the manufacturer.

E. In the event hoses are not tightened securely, possible failures to hydraulic system can occur.

   1) If pressure supply hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit, resulting in increased RPM in the power unit.

   2) If return line hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit and the hydraulic system to the tong itself, resulting in the tong motor increasing to maximum pressure and possible motor seal failure.

F. After completion of A through E restart the power unit and allow engine to idle for approximately 10 minutes. Slowly close bypass valve to allow circulation of hydraulic oil through tong and hoses. Place shifting lever into low and rotate several times. Repeat in reverse. If correct jaw-die combination is installed, the unit is now ready to run pipe.

G. Adjust height of tong to proper height, using the control valve located all the way to the right of rear valve bank assembly.

H. Stand in the normal operators position, insert the locking pin into the rear cage plate hole (on operators side). This pin allows ring gear to rotate clockwise (make-up) and engage the cam to close jaws on pipe.

I. Swing tong and backup onto tubing, making sure to align tubing on rear jaw of backup. Close backup jaws by pushing middle control lever forward. The design of the **CLINCHER®** Integral Backup centers pipe in the backup and tong. Close tong door.

J. Rotate ring gear clockwise by pushing motor control lever on the front valve bank assembly forward until jaws lock on pipe and continue to rotate until desired amount or torque is applied.

K. After correct amount of torque specific to that connection has been applied, release tong jaws by pulling back on motor control lever until jaws release and throat in cage plate is aligned with door opening. Open door.

L. Release backup by pulling back on right control lever on rear valve bank assembly until backup jaws are completely retracted.

M. High and low gear is adjusted by use of shifting lever PN 55071, located to the left side of the shifting housing. With the lever in the upwards position the tong is in high gear. With the shifting lever in the downward position, the tong is in low gear.

MAINTENANCE INSTRUCTIONS

CLINCHER® recommends that owners of **CLINCHER®** Hydraulic Power Tongs, Backups, **CHROMEMASTER™**s and accessories adapt a regularly scheduled maintenance program. Implementation of this type of program offers several benefits. First you increase the life of your equipment, secondly, you may find a problem before it escalates to a costly repair or down time on the job, and most importantly, prevent injury to operating personnel.

A major inspection (described at the end of this section) should be carried out if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out.

Routine Maintenance

Cleaning - Upon return from each and every job:

A) Pre-wash unit to remove majority of dirt and grease build up as to allow removal of dies, and inspection of overall condition of unit.

B) Remove and inspect dies from tong and backup. Note any missing or damaged die retainers, and or die retainer bolts.

C) Remove side jaws from tong and inspect side jaw for missing or broken parts, damaged splines, broken ears (locking hooks on front portion of side jaws.)

D) Clean and inspect side jaws, jaw pins, jaw rollers for damage or excessive wear (cracks, breakage, and uneven wear patterns). Reassemble jaw sections replacing any damaged parts. Lubricate pins, and rollers and reinstall in tong.

E) Clean and inspect backup operating cylinder. Insure sline area is free from damage and any rust or dirt is removed. Replace any missing or damaged die retainer clips and die retainer bolts.

F) Inspect all hoses for wear, replace as necessary.

G) Inspect hanger assembly to assure all parts are returned and in operating condition. (*i.e.* H-Plates, spring, leg springs, leg spring caps and pins.)

H) Replace jaw, pins and rollers in tong.

I) Lubricate tong's cam followers (upper and lower), dumbell roller shafts (upper and lower zerts), door shaft, and idler gear shafts (3), (Pinion gear and smart gear assemblies are installed with sealed bearings. There is no provisions to grease these bearings. However, if replaced by non-sealed bearings, the 1/8" N.P.T. flush plugs should be replaced with zerts PN 1001 and both gear assemblies should be added to the regular lubrication schedule.), shift housing (2 zerts), and re-pack tong body cavity. Lubricate zerts in backup plates and pins.

MAINTENANCE INSTRUCTIONS

J) Install dies of a size needed for testing purposes, and attach hydraulic power unit to tong. Before energizing power unit make certain no one is working on tong or backup and all tools and parts are removed from the tong and backup.

K) Insert test mandrel of the exact same size as the dies which are installed in the tong and backup. Caution: Testing the function of the backup without the proper size dies installed and/or without the proper sized mandrel in place, you risk serious damage to the backup cylinder.

L) After power unit has reached operating R.P.M. and temperature, operate the backup control valve and close backup around test mandrel using sufficient flow and pressure to clamp mandrel and maintain pressure to backup. (Recommended operating pressure of 2,500 psi) Backup pressure gauge should match system operating pressure. After release of control valve you may experience a slight drop in backup pressure (up to 300 psi) this is normal. If backup pressure drops more than 300 psi within 2 minutes, you may be experiencing a hydraulic leak.

M) While maintaining pressure on backup visually inspect hoses, stainless steel lines, fittings, etc., for seepage of hydraulic fluid. Repair or replace parts causing leaks. If you see no visible external leaks and your backup is still losing pressure, there may be an internal leak in the operating cylinder or load holding valve allowing fluid to bypass the piston. It is recommended that the backup be returned to the manufacturer for repair.

N) If at this time your backup is functioning correctly, open and close unit several time to insure consistent operation.

O) With the proper dies installed in the tong and backup, and test mandrel locked in the backup, place reversing pin into the make-up position, set tong into low gear and operate tong through several cycles of locking, biting and torquing to required torque. Change reversing pin to break-out position and repeat. Repeat same procedure in high gear.
Note: Torque developed in high gear is considerably less than torque developed in low gear.

P) Test door interlock system by opening door slightly with tong rotating. (Remove test mandrel for this procedure.) The tongs rotation should stop. If tong rotation fails to stop, close door, cease rotation, deactivate power unit, and inspect door interlock switch for damage. Insure that adjustment collar is oriented to allow wheel of door switch to fit into recess on collar.
Warning: If door switch system is not functioning properly tong must not be used.

Q) Reinspect tong and backup hydraulic system for leaks.

R) If at this time the unit is functioning as intended, replace all covers and grease splines in tong and backup (side jaws and back jaws), tape or grease spools on control valves (to prevent paint from adhering to polished spool surface), prime and paint unit for storage.

MAINTENANCE INSTRUCTIONS

Recommended Lubrication Schedule Performed After Completion Of Each Job

Hydraulic Tong

a) Cam followers: upper and lower (all)
b) Dumbell roller shafts: upper and lower (all)
c) Door shaft
d) Idler shafts (3)
e) Shift housing (2 zerts)
f) Re-pack tong cavity
g) Pinion and smart gear shafts (if sealed bearings have been replaced by non-sealed bearings)
h) Jaw rollers and pins: Remove jaw pins and rollers, clean and lubricate with gear grease
i) Inspect hydraulic fluid for foreign material and contaminant. Filter or replace. Your must filter or replace entire system including power unit tank and lines along with tong to insure all contaminants are removed.

Annual Major Maintenance

Inspection and repair

Routine preventative maintenance will significantly extend the operating life of your equipment, reduce operating cost and avoid downtime. **CLINCHER®** recommends a program of frequent routine inspection, and if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out, perform the following:

A) Visually inspect components on power tong or backup which could possibly have been damaged either during operation or transit. *i.e.* Damage to hanger assembly, hydraulic backup, mounting legs, or hydraulic valve assembly.

B) Check test date. Ensure that a load test and inspection was carried out within the last 9 months.

C) Check ring gear. Check for any signs of damage or wear.

D) Remove motor and valve assembly from the tong body.

E) Check motor seal. Apply hydraulic power, run motor and visually check motor seal for any signs of leakage.

F) Check drive gear, high and low pinion gears. Check for excessive sign of wear on motor gear.

G) Check condition of control valve spools. Activate valves and check for any sign of wear, pitting, or scoring of the chrome surface of spools. If spool is damaged in any way, the complete section must be changed out. Spools are not interchangeable.

MAINTENANCE INSTRUCTIONS

H) Check gear selector and shaft. Visually inspect the shifting shaft for alignment and straightness.

I) Check Hi/Low Gear assembly. Visually inspect high and low clutch and gears for any sign of chipped, broken, or worn teeth.

J) Check dumbell rollers, shafts and bushings. Check for excess movement on either bearings, bushings, shafts or dumbells.

K) Check idler gears and center pinion shaft gears and bearings. Check that there are no signs of worn, chipped, or broken teeth on idler and center pinion shaft gears.

L) Check door bearings. Visually check excess movement on bearings at door assembly. If excess movement is found door must be removed making careful note of bearing washers positions for reassembly.

M) Check door switch system. Visually check that door switch valve has sufficient strength to hold door in closed position. If this is not the case, then repairs are required.

N) Check door safety device. Functionally check tong door safety switch. Engage low gear, open tong door and push rotor control lever forward as if to rotate rotor. If safety device is operational then the rotor will not rotate.

O) Check lifting hanger test date. Check lifting hanger for damage. Ensure that a load test and inspection was carried out within the last 9 months.

P) Check condition of all hydraulic hoses and fittings. Visually inspect all hydraulic hoses fitted to the tong and in the backup for any signs of leaks, cuts, or wear.

Q) Reinstall all parts which were removed for inspection and/or damage. Connect to hydraulic power supply and function test operation of tong in high, low, forward, and reverse. Torque test utilizing appropriate dies and test mandrel. Test operation of lift cylinder.

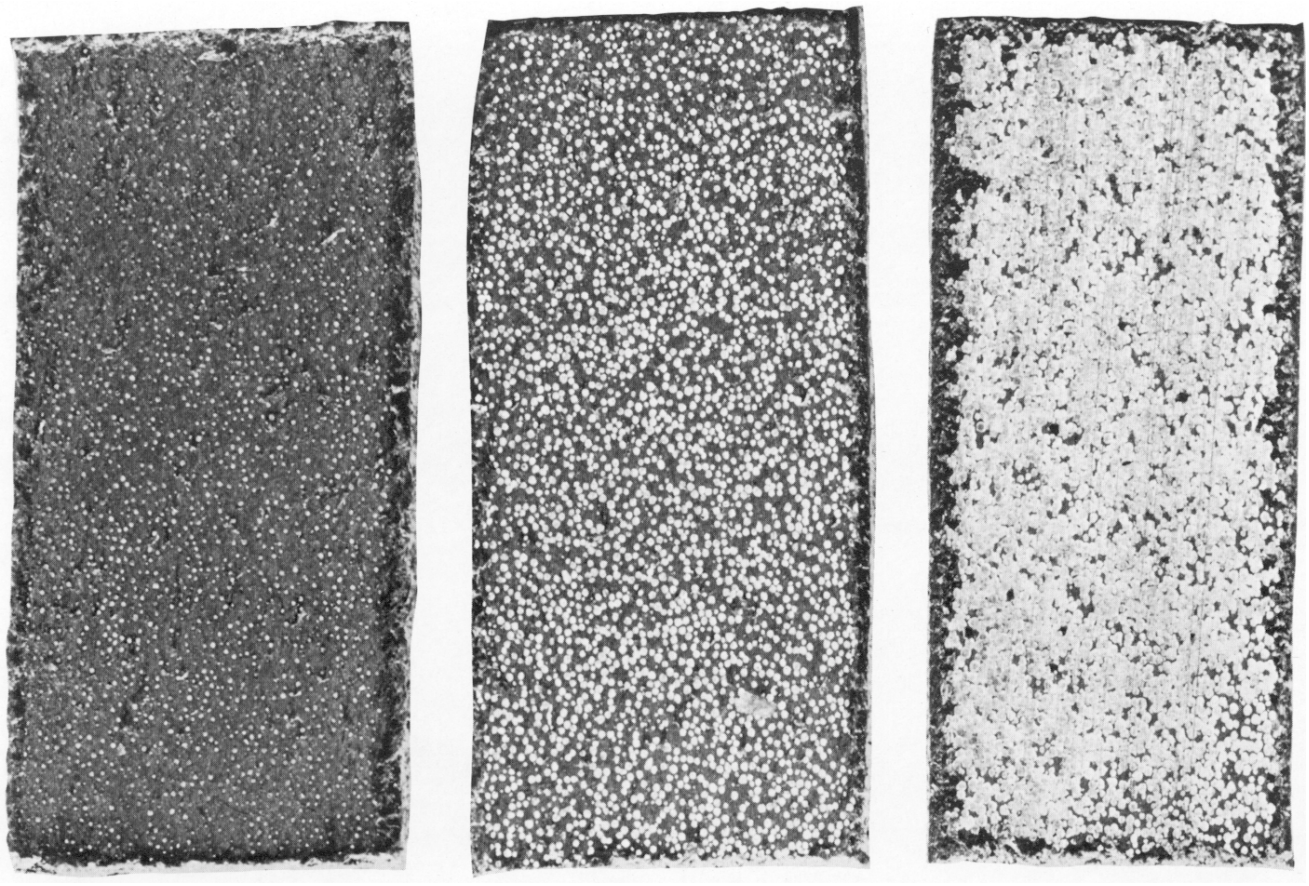
R) Inspect power unit system according to manufactures specifications.

S) Lubricate tong and backup according to maintenance schedule preceding this section.

T) Paint, remembering to mask off surfaces not intending to paint with grease or masking tape.

U) Complete dated inspection report giving details of all duties performed along with complete list of items replaced.

DU® BEARING DRY WEAR PROCESS



1. 2. 3.

1. Running-in completed. Low wear rate starts when up to 10% of the bronze is exposed.

2. Typical surface appearance when DU® bearing approaches its half life with 40% to 50% of the bronze exposed.

3. Bronze is beginning to smear near the end of DU's useful life as a dry bearing. Over 75% of the bronze is visible at the surface.

For additional information about DU bearings, please contact Garlock Bearings Inc,
700 Mid Atlantic Parkway, Thorofare, New Jersey 08086. **(609) 848-3200** FAX: (609) 848-5115

TROUBLESHOOTING

HYDRAULIC SYSTEM

Hydraulic Pump Making Excessive Noise:

	Problem	Solution
A)	Restricted or clogged intake line	Clean line, check for contamination.
B)	Contaminated fluid	Flush system, change fluid.
C)	Restricted vent	Clean or replace air vent.
D)	Air in fluid	Check for leaks and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
E)	Damaged or worn parts	Repair or replace damaged parts, check fluid for contamination.
F)	Excessive RPM	Check PTO, gears, and recommended speed to assure proper pump is installed for operation.
G)	Increased friction	Make sure pump has been assembled using correct torque values.
H)	Damaged or worn relief valve.	Replace relief valve.
I)	Damaged or worn check valve.	Replace check valve.
J)	Restricted discharge	Check to make sure relief valve is set to proper pressure.
K)	Valve system restricted	Inspect and repair or replace defective parts, check system for contamination.

Excessive Wear to Hydraulic Components:

	Problem	Solution
A)	Fluid contamination	Flush fluid system, replace with new fluid.
B)	Components misaligned	Inspect and realign.
C)	High operating pressures	Gauge and set to proper pressure.
D)	Exhausted fluid (depletion of additives)	Flush fluid system, replace with new fluid.
E)	Air in fluid	Check for leaks, and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
F)	Shortened bearing life	Check alignment, insure proper lubrication to non-sealed bearings.

TROUBLESHOOTING

HYDRAULIC TONG SYSTEM

Slow Tong Speed:

	Problem	Solution
A)	Restricted supply line	Clear supply line and check intake on reservoir.
B)	Low fluid level	Add fluid to proper volume.
C)	Air leak	Locate and repair leak.
D)	Pump speed insufficient	Assure proper pump speed for application.
E)	Damaged or worn equipment	Isolate pump and check pressure to determine whether motor or pump is defective. Repair or replace defective part.
F)	Pump not primed	Check fluid viscosity and restrictions of intake line. Replace fluid if inadequate for operating temperature.
G)	Low or no flow from supply line	Check to assure couplings are securely fastened.
H)	Hydraulic bypass valve malfunction	Inspect. Adjust unloading pressure. Replace or repair as necessary.

Insufficient Torque:

	Problem	Solution
A)	Door switch malfunctioning	Check to make sure door is completely closed. Inspect door switch and dump valve. Replace or repair door switch and/or dump valve.
B)	Relief valve malfunctioning	Relief set too low, broken valve spring, contamination or defective seals.
C)	Damaged or worn pump parts	Inspect, repair, or replace.
D)	Slow pump speed	Assure proper pump speed for application.
E)	Improper system fluid	Check fluid viscosity and replace fluid if inadequate for operating temperature.
F)	Directional control valve set improperly	Check relief and directional control valve. Neutral should return slightly to reservoir.

TROUBLESHOOTING

HYDRAULIC TONG SYSTEM

Insufficient Torque:

	Problem	Solution
G)	Damage tong motor	Inspect, repair, or replace.
H)	Restriction of supply line, excessive back pressure	Check to assure couplings are securely fastened.
I)	Defective gauge or load cell	Inspect, repair, or replace. Assure unit has been calibrated to proper arm length. NOTE: When using **CLINCHER®** integral backup system, it is the length of backup arm, NOT the tong arm length.

Difficulty Shifting Gears:

	Problem	Solution
A)	Broken key in shifting yoke	Inspect and replace key stock in shifting yoke.
B)	Worn or damaged shifting yoke pins	Inspect and replace broken or worn pins.
C)	Insufficient lubrication	Pump grease into both zerts located on shift housing.
D)	Detent ball bearing spring set too tight	Inspect and relieve pressure by adjusting set screw on shifting gear PN 55084.

Failure to Grip Tubulars:

	Problem	Solution
A)	Jaws move out from neutral, but fail to penetrate pipe. Tong not perpendicular.	Inspect die size and replace with correct dies for pipe. Wrong size dies for tubulars. Assure suspension of tong is perpendicular to tubulars. Adjust hanger as necessary.
B)	Jaws fail to move out of neutral. Brake band not tight enough, faulty cam followers, rust debris or damage to jaws.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.

TROUBLESHOOTING

HYDRAULIC TONG SYSTEM

Failure to Grip Tubulars:

	Problem	Solution
C)	Tong will not release from tubular. Brake band not tight enough, defective cam followers in cage plate, insufficient lubrication to jaw pin and roller.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.
D)	Tong motor runs but ring gear does not rotate. Broken gears or defective shift in hydraulic tongs system.	Inspect and replace defective gears. Inspect and repair or replace defective shifting parts.
E)	Tong binds under light load. Worn or damaged cam followers, dumbell roller bearing, or idler bearing.	Inspect and replace defective parts.
F)	Ring gear rotates while control lever is in neutral.	Replace control valve.
G)	Shift will not stay in set position. Lost detent ball or spring.	Replace detent ball and spring.
H)	Hydraulic fluid leaking from motor. Damaged or worn motor shaft seal.	Replace motor shaft seal.

HYDRAULIC BACKUP SYSTEM

Failure to hold tubulars:

	Problem	Solution
A)	Incorrect die for size tubular	Check pipe OD and match die size to pipe OD.
B)	Dies have material compacted in tooth area; worn teeth.	Clean dies with wire brush and inspect. Replace with new dies if necessary.
C)	Power unit pressure set incorrectly	Inspect relief valve on power unit to make sure enough system pressure is being delivered to backup.
D)	Counter balance valve not holding pressure	Remove side plates on backup. Bench test and replace the defective counter balance valve.
E)	Internal leakage in backup cylinder	Disconnect lines and bench test cylinder. Repair or replace as necessary.
F)	Jaws will not retract. Counter balance valve is stuck.	Replace counter balance valve.
G)	External leakage of cylinder	Repair or replace cylinder.
H)	Control valve set to neutral, but jaws extend.	Inspect control valve for damage and/or incorrect spool. Repair or replace as necessary.

SECTION 7 5 1/2" XHT TONG & BACKUP PARTS LISTS

RECOMMENDED TONG SPARE PARTS LIST

Part Number	***Quantity***	***Description***
12501437	1	Seal for Rineer Motor
59028	2	Standard Jaw Pins
59028-01	2	Low Friction Jaw Pins
59027	2	Standard Jaw Rollers
59027-01	2	Low Friction Jaw Rollers
1001	8	1/8 NPT Zerts
SLV1000-01	1	Door Switch Assembly
45061	1	Shifting Yoke (Model XHT)
59061-01	1	Shifting Yoke (Model XHT01)
59008	1	Brake Band Assy. (Model XHT)
59008-01	1	Brake Band Assy. (Model XHT01)
BUCD5514	2	Die Clip (DP Backup)
VA20-MRV-1	1	A-20 Relief Cartridge

ACCESSORIES AND OPTIONS

Several different accessory items are available for the **CLINCHER®** Tong and Backup to allow them to be customized to provide a system most appropriate for the end user's application.

CLE5500XHT Tong Accessories

Compression Load Cell and Torque Gauge	directly measures applied torque
Tension Load Cell and Torque Gauge	directly measures applied torque
Solenoid Operated Module for Dump Valve	allows computer to limit torque applied
Adapter for Turns Proximity Switch	allows computer to sense rotation
3 Point Lifting Bridle	alternative lifting system
Lift Cylinder with Integral Spring Hanger	controls vertical position
TSP-80 Tong Speed Control	allows slow speed rotation with full torque
Alternate Motor Displacements	

BUCD5500 Backup Accessories

Backup Handles	simplifies manipulation
Shipping Skids and Cages	simplify handling, transport and help guard against damage

SECTION 9 XHT TONG ILLUSTRATIONS

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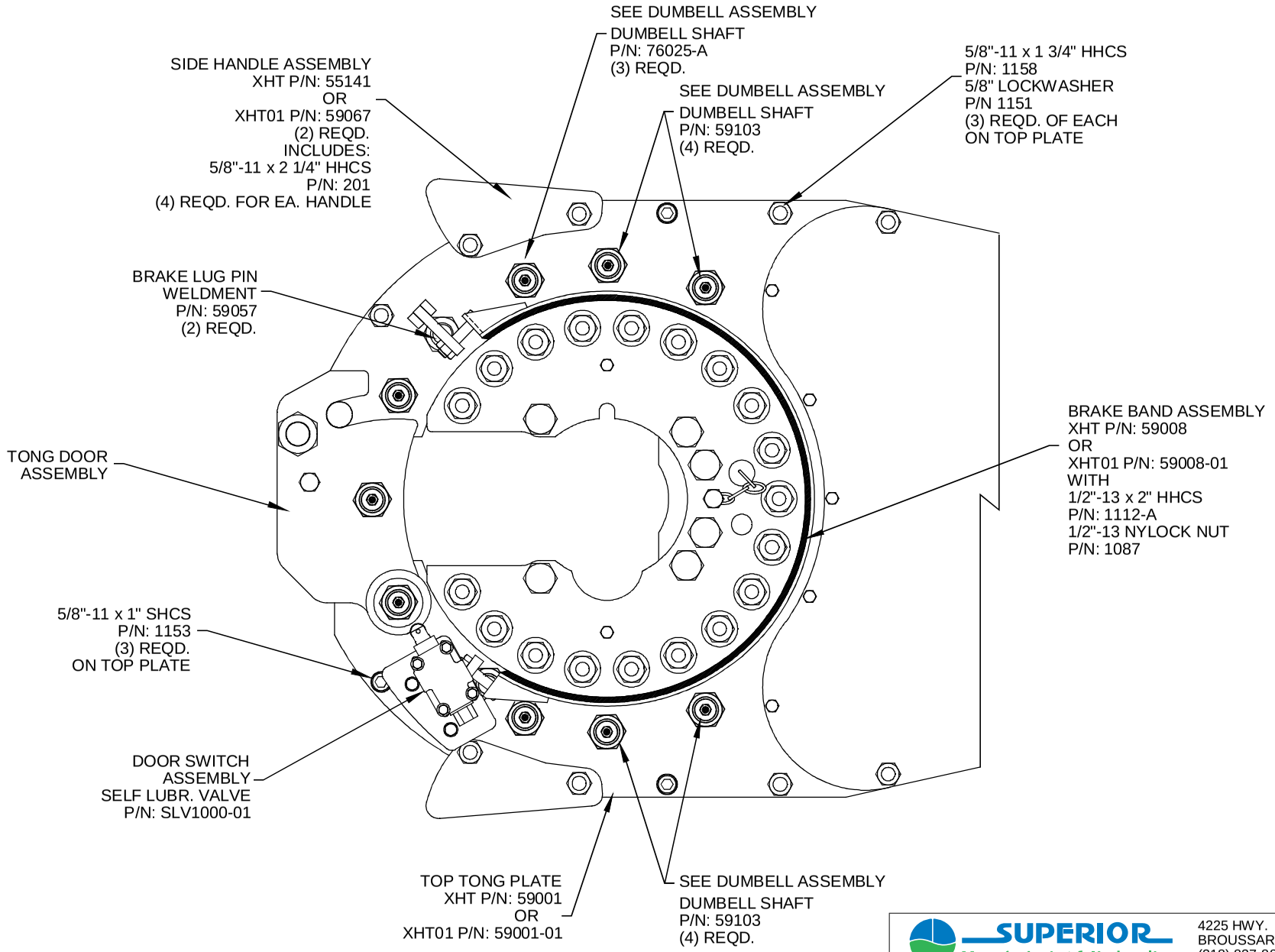

TOP VIEW

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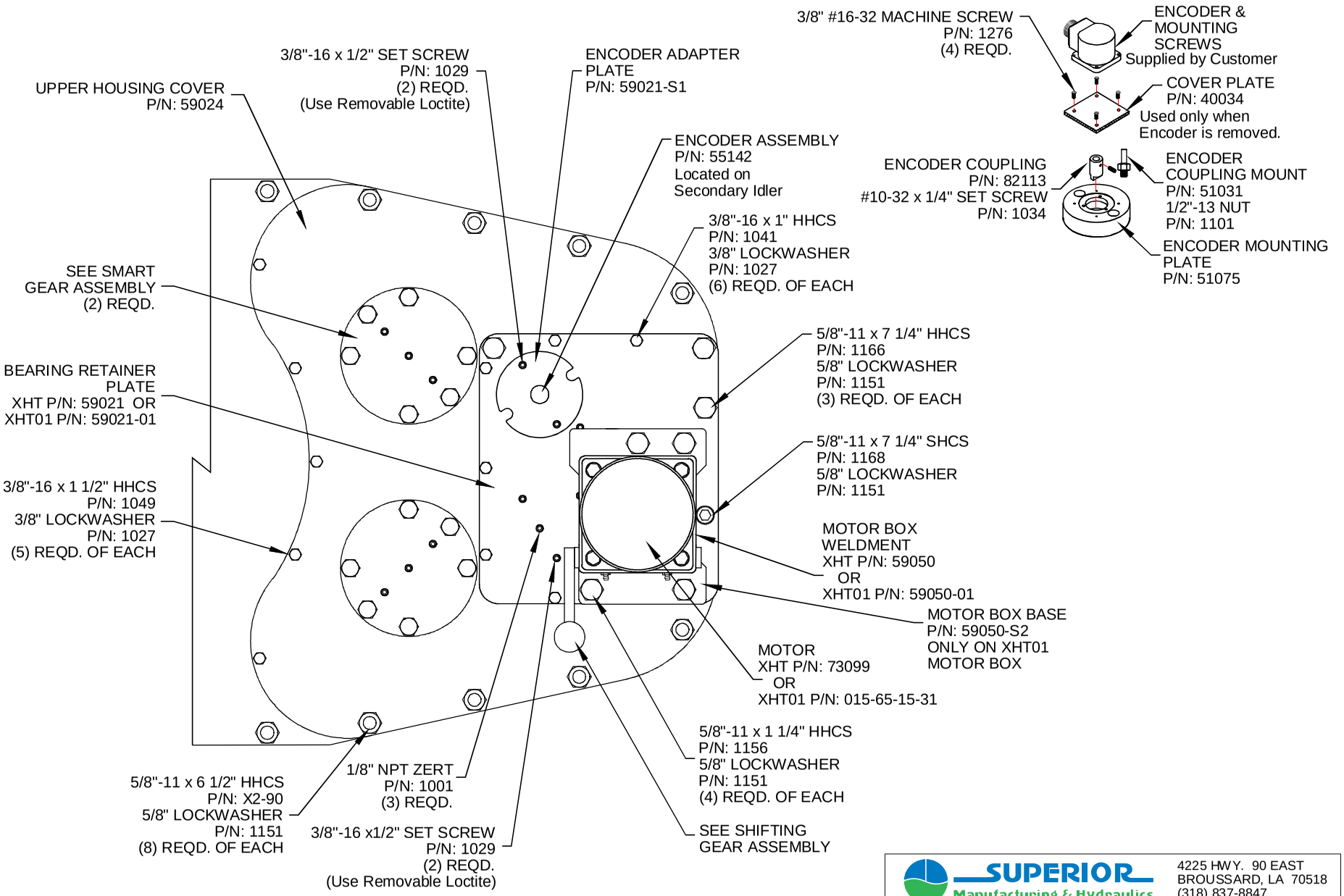
REV. #	LOG #	DATE
1		05/16/07

REF: P:\Manuals\Equip Manuals\Dwgs\CLE5500XHT\Top View Sh1 rev1.wpg



TOP VIEW

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		09/03/02
REV. #	LOG #	DATE

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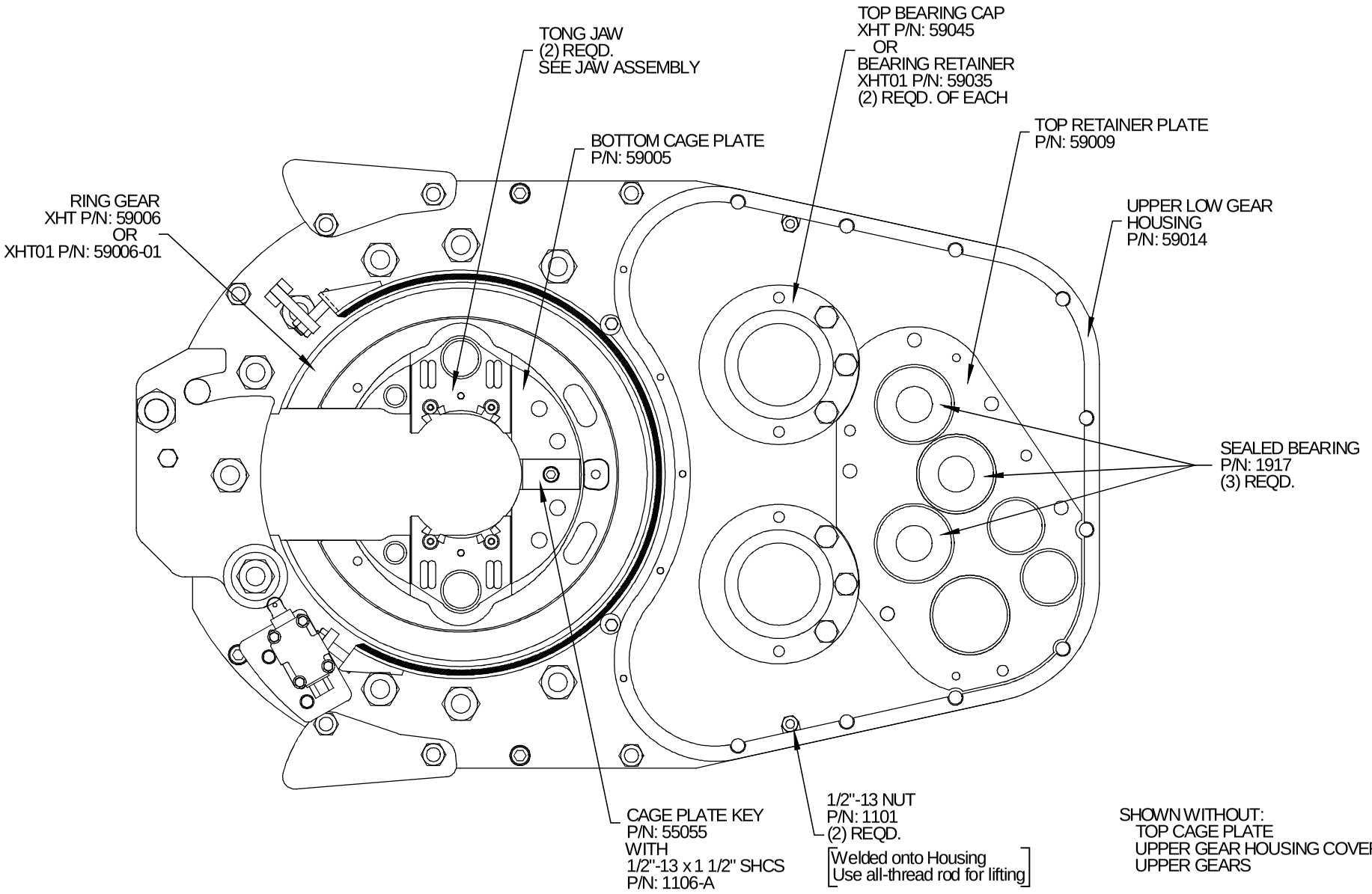

TOP INTERNAL VIEW

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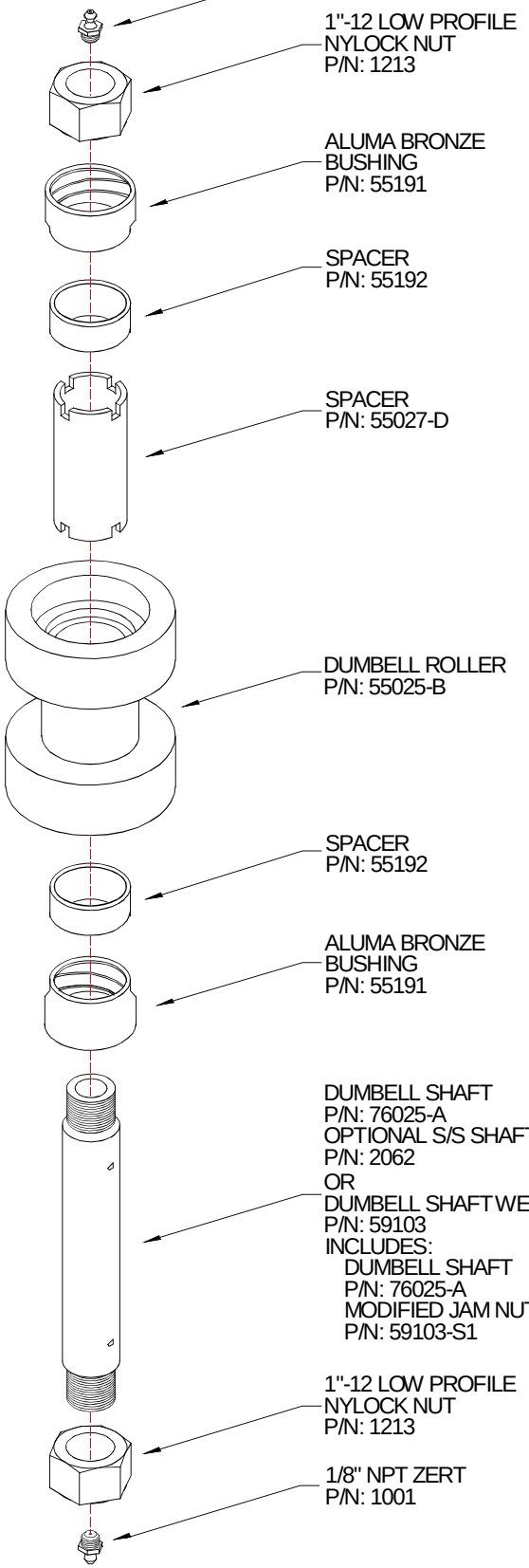

DUMBELL ROLLER ASSEMBLY

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		08/08/02
REV. #	LOG #	DATE

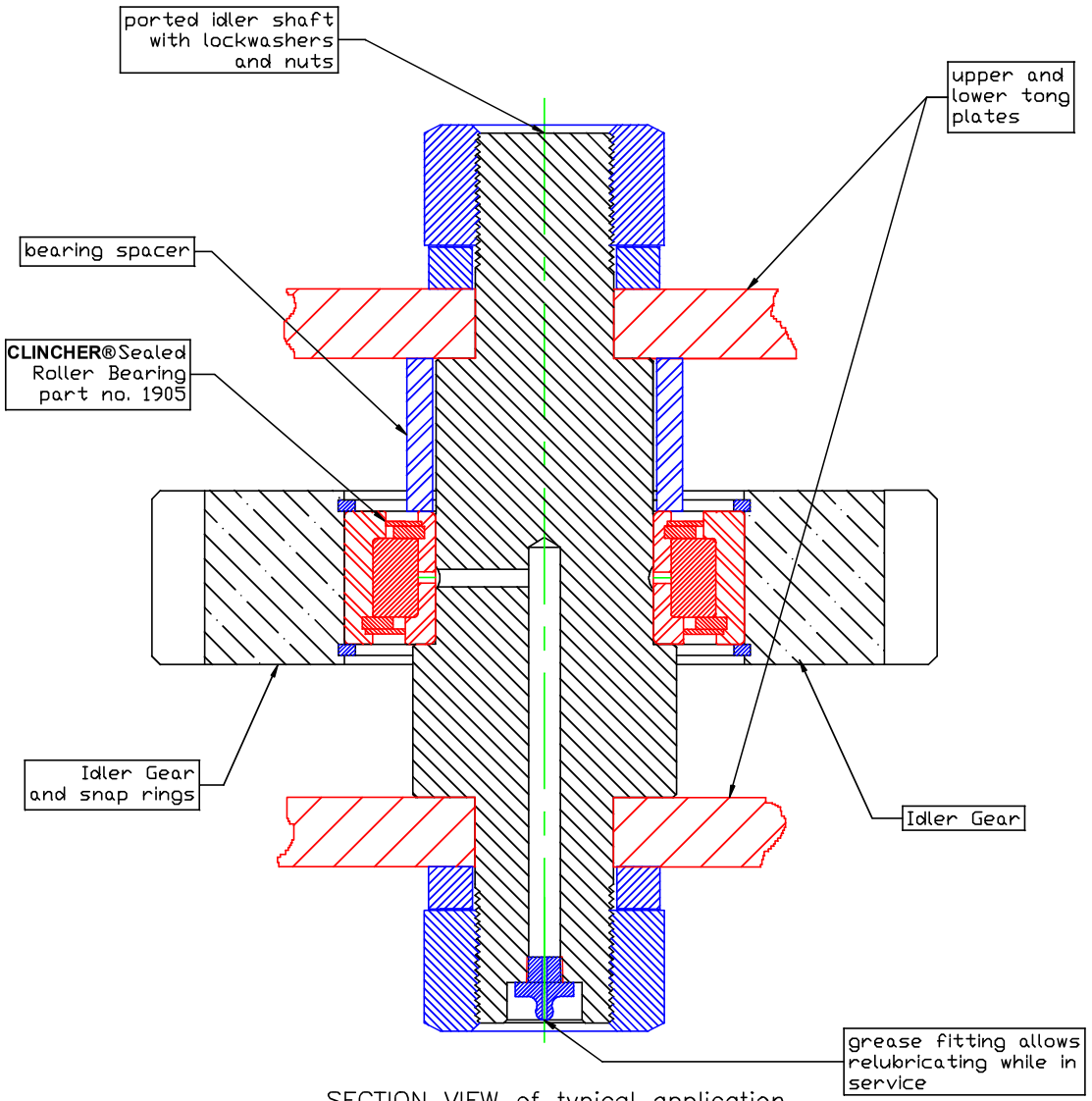
REF: P:\Manuals\Equip Manuals\Dwgs\CLE5500XHT\Dumbell Roller.wpg

Features and Benefits:
Proprietary sealed bearing with full compliment roller design offers greater load ratings than commercially available sealed ball bearings. The ported inner race allows the bearing to be relubricated without disassembly. Integral elastomeric seals allow grease to be displaced but prevent migration of containminants into bearing.

Elastomeric seals are corrosion resistant and suitable for use in environments which are incompatible with traditional aluminum bearing shrouds.

Unique geometric design allows rollers to absorb thrust loads to maximize component life.

Nominal OD: 4.3307 inches
Nominal ID: 2.3622 inches
Nominal Ht: 1.4375 inches
static rating: 37540 lbs
dynaminc rating: 29230 lbs
(1mm cycles, 33 1/3 RPM f/ 500 hrs.)


ported idler shaft with lockwashers and nuts
upper and lower tong plates
bearing spacer
CLINCHER® Sealed Roller Bearing part no. 1905
Idler Gear and snap rings
Idler Gear
grease fitting allows relubricating while in service

SECTION VIEW of typical application

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE						R3
2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5°	SURFACE 250	FLATNESS AR PL. ± .015 per foot	

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

Rev.#	By	Log#	Description of Revision
3			
2			
1	DB	12/07/02	added desc of thrust load capability

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△1 or ⟨1⟩ = Revision Number

1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 2

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(318)837-8847

PART NAME: SEALED IDLER BEARING

PART #: 1905

DRAWN BY:

APPROVED BY:

CHK BY: DATE:

REF: ILL1000/ILL1142.DWG

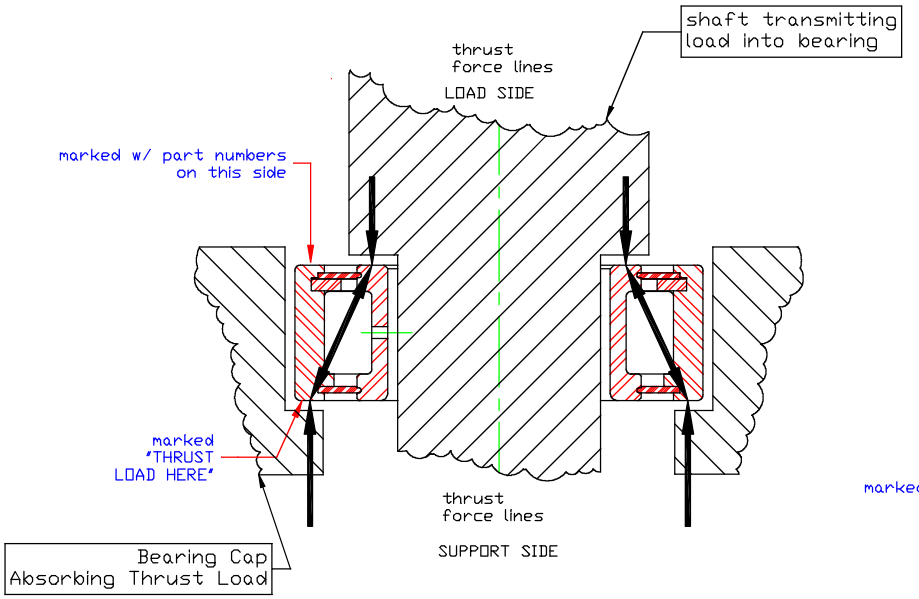
MATERIAL SPECIFICATION

Matl.Req:

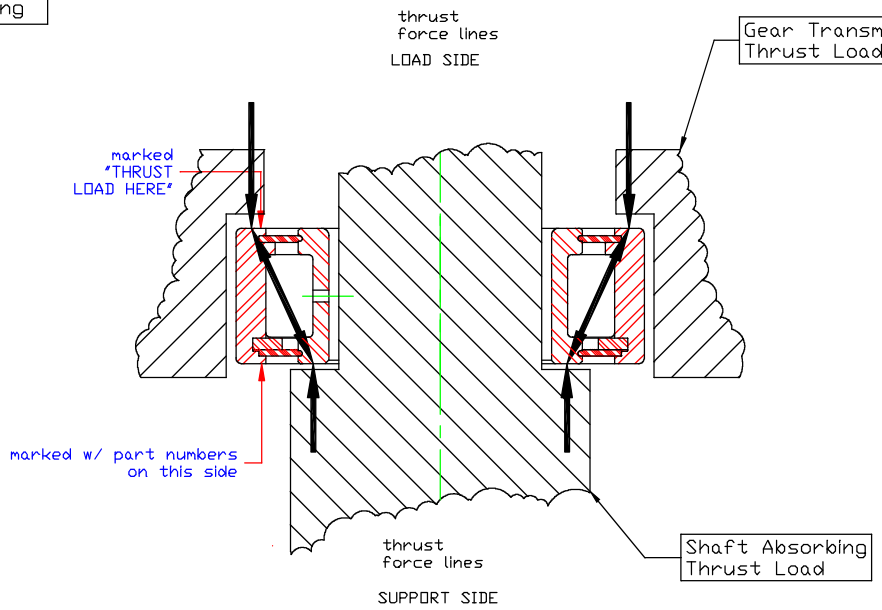
Initial Condition:

Alternative Matl:

H.T Instructions: Case Depth: C.D



Bottom Bearing Cap Application



Gear Support Application

Installation instructions for **CLINCHER®** BEARING Part Number 1905

Rev.#	By	Log#	Description of Revision
3			
2			
1	DB	12/07/02	added desc of thrust load capability

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UNLESS OTHERWISE SPECIFIED TOLERANCES ARE R3

2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5°	SURFACE 250	FLATNESS AR PL. ± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

△1 or ⟨1⟩ = Revision Number

1.000 = Critical Dimension 100% Inspection Required

SHEET 2 of 2

SUPERIOR Manufacturing & Hydraulics
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BROUSSARD,LA 70518
(318)837-8847

PART NAME: Installation instructions for P/N 1905 SEALED IDLER BEARING

PART #: 1905

DRAWN BY:

APPROVED BY:

CHK BY: DATE:

REF: REF ILL1000/ILL1142.DWG

MATERIAL SPECIFICATION

Matl.Req:

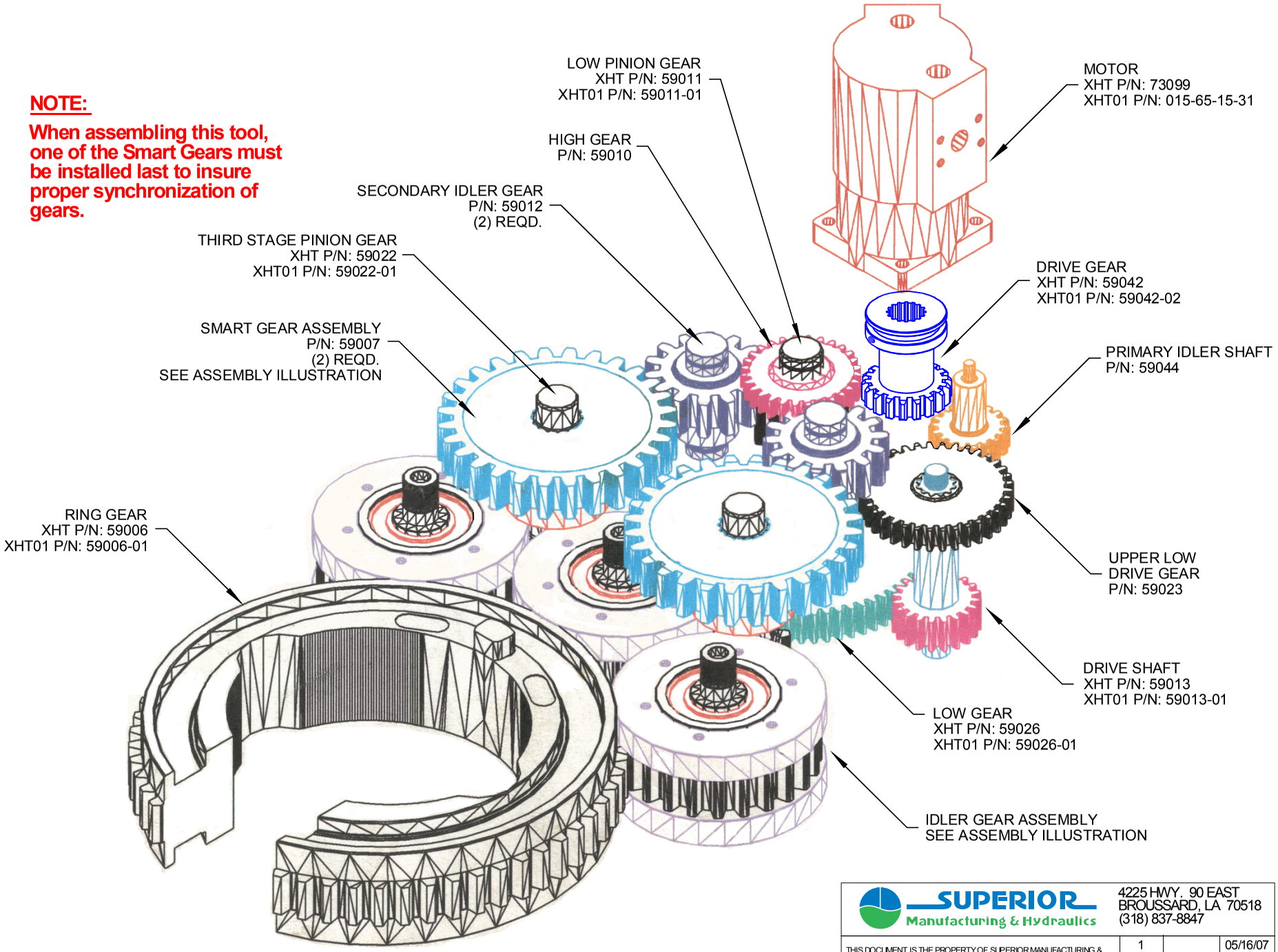
Initial Condition:

Alternative Matl:

H.T Instructions: Case Depth: C.D

NOTE:

When assembling this tool, one of the Smart Gears must be installed last to insure proper synchronization of gears.



GEAR TRAIN

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REV. #	LOG #	DATE
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REF: P:\Manuals\Equip Manuals\Dwgs\CLE5500XHT\Gear Train rev1.wpg

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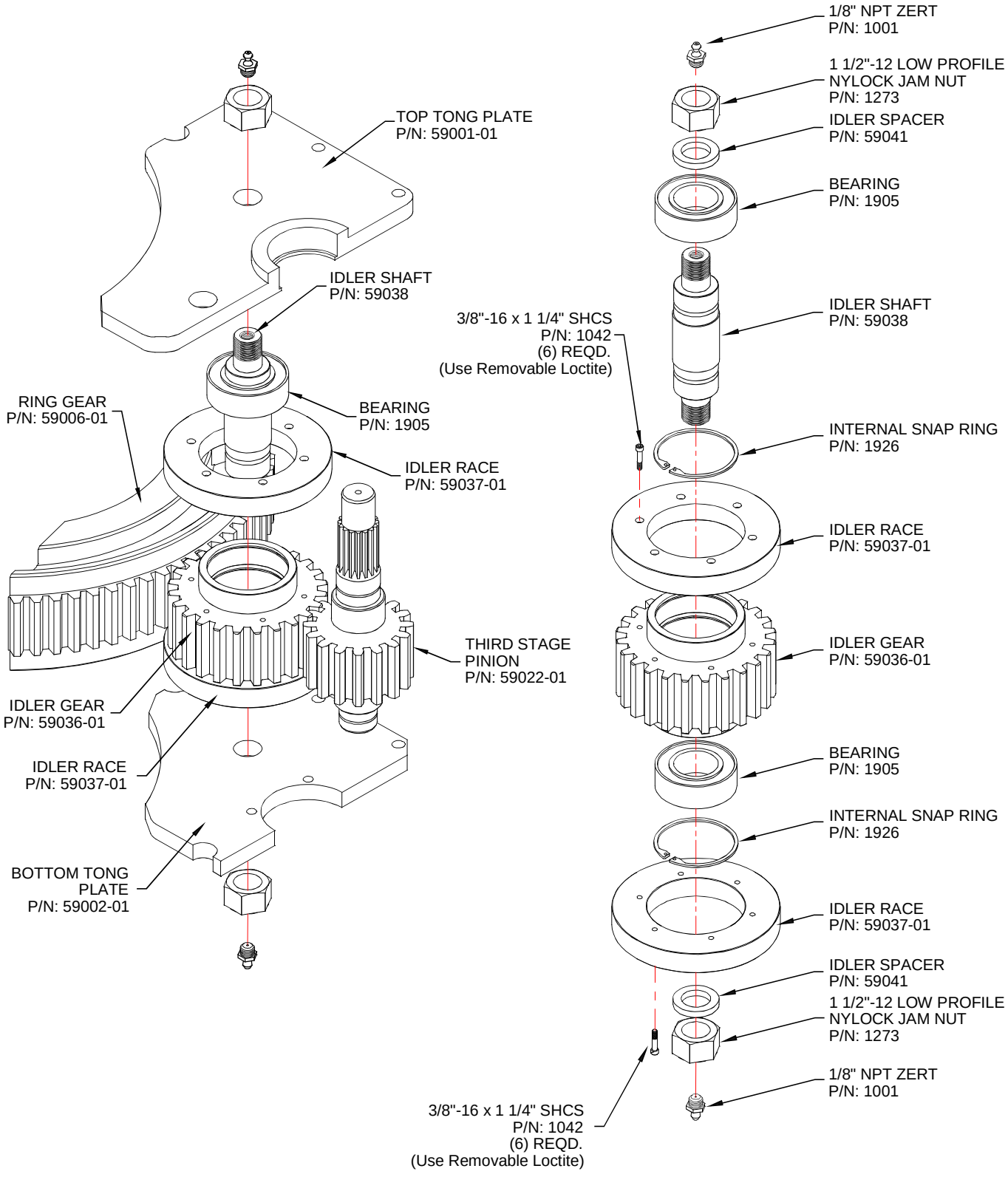

IDLER GEAR ASSEMBLY

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REV. #	LOG #	DATE
1		10/01/02

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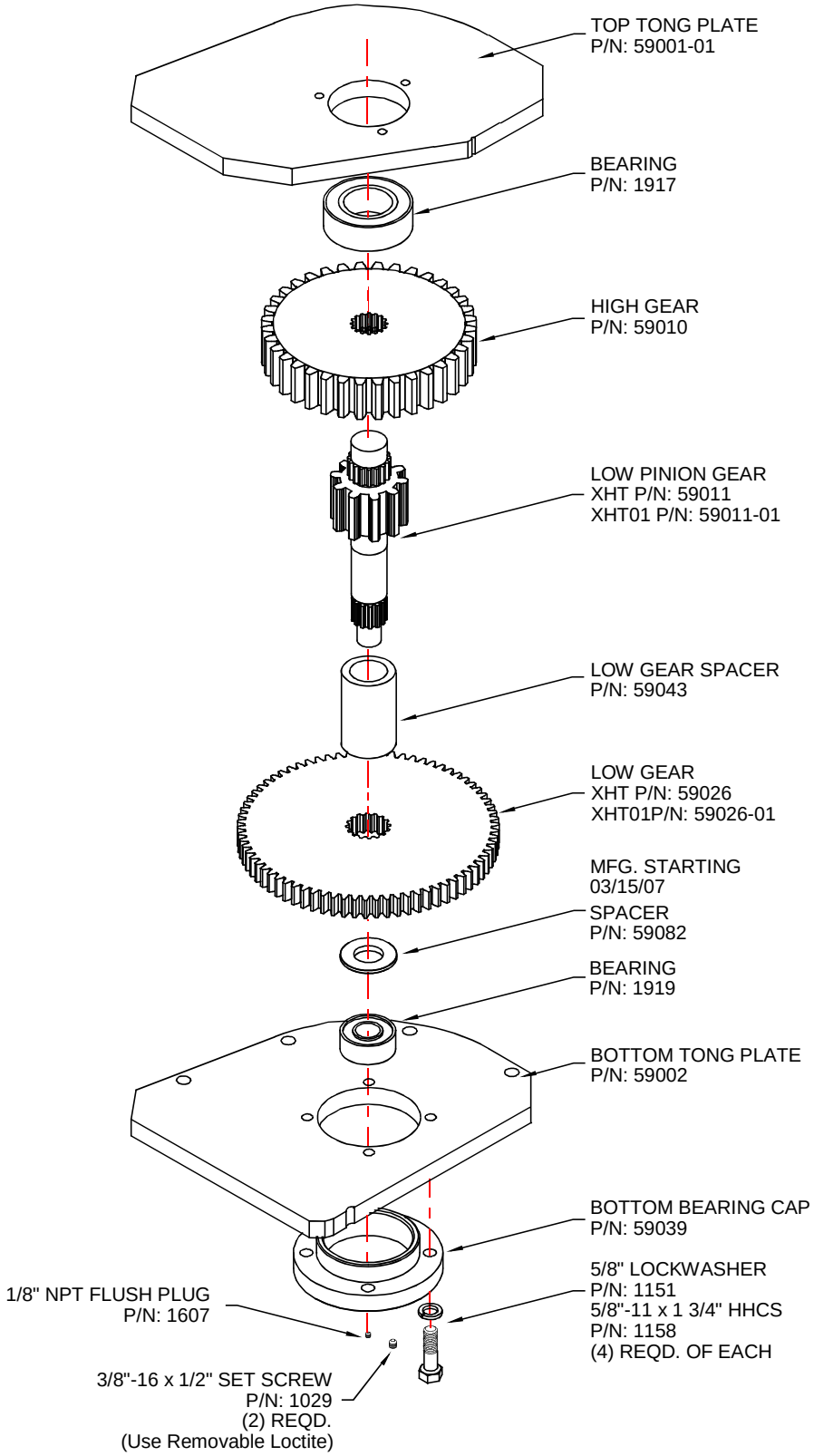

PINION GEAR ASSEMBLY

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REV. #	LOG #	DATE
4		01/18/08

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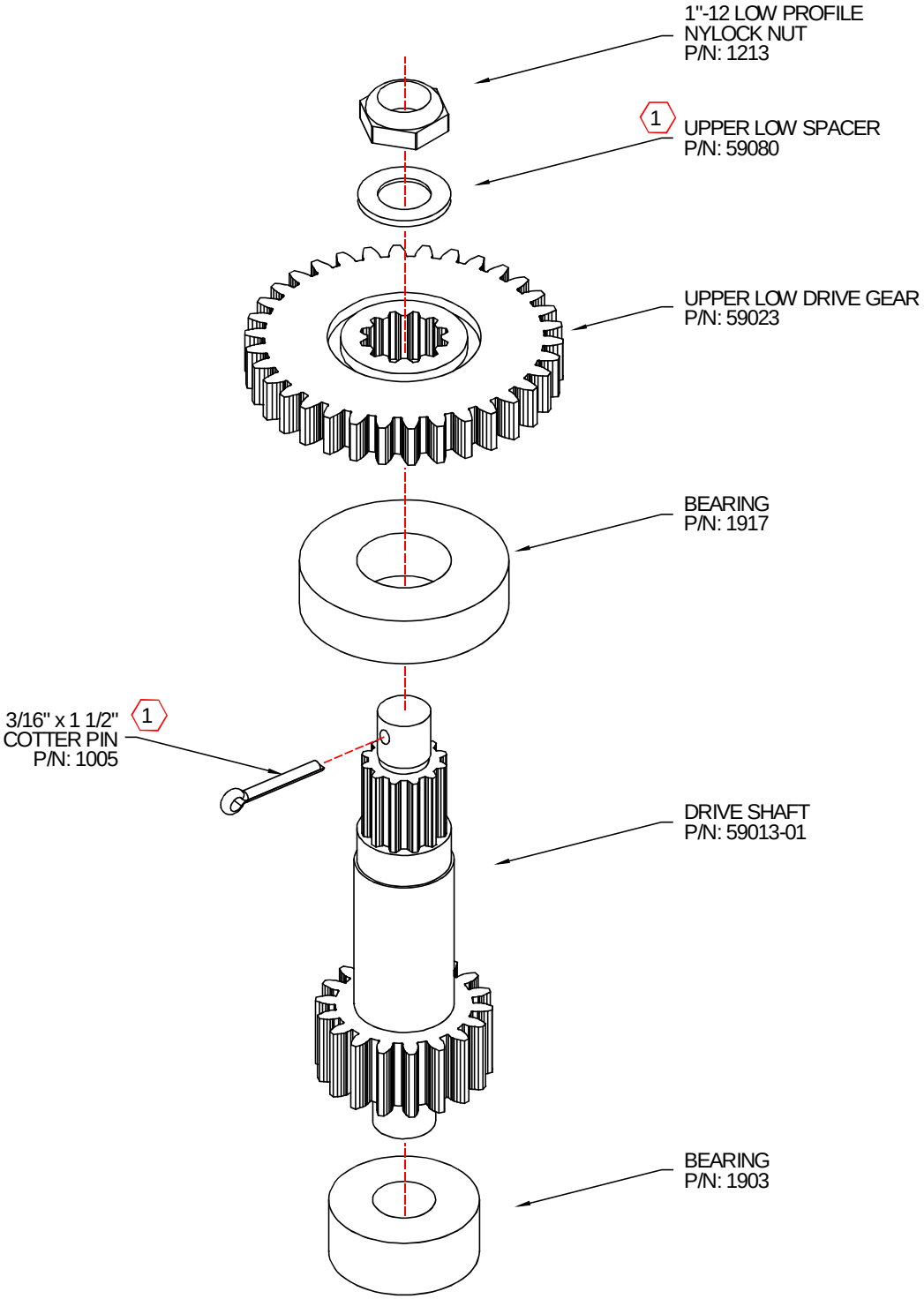

UPPER LOW DRIVE GEAR ASSEMBLY

Rev.	Date	Description
1	12/05/07	Added Cotter Pin PN 1005 for mfg. beginning 01/09/01.
		Added Upper Low Spacer PN 59080 to illustration.

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REV. #	LOG #	DATE
1		12/05/07

REF: P:\Manuals\Equip Manuals\Dwgs\CLE5500XHT\Up Low Dr Gear rev1.wpg

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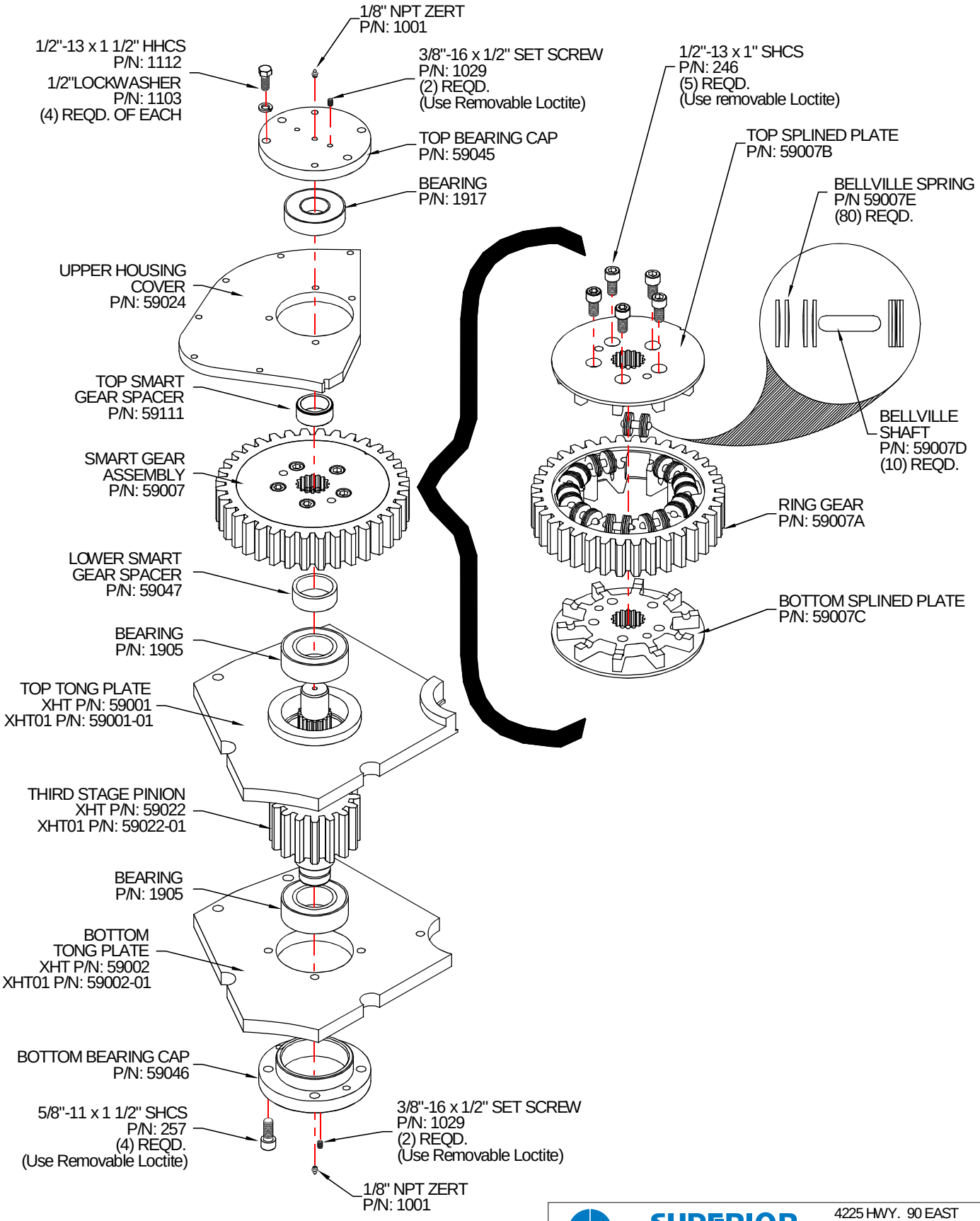

SMART GEAR ASSEMBLY

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REV. #	LOG #	DATE
2		02/25/04

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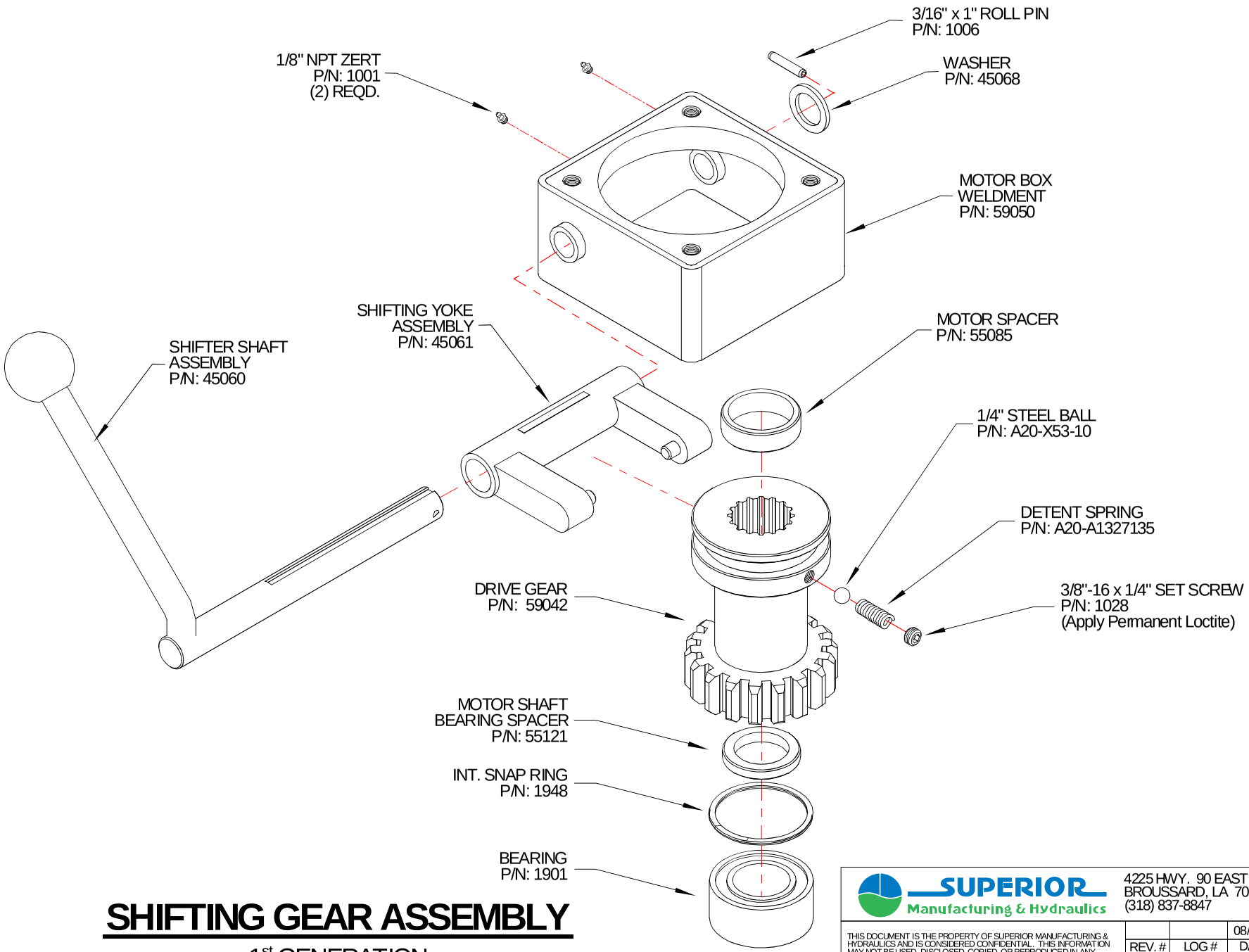

SHIFTING GEAR ASSEMBLY

1st GENERATION
Model CLE5500XHT

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		08/14/02
REV. #	LOG #	DATE

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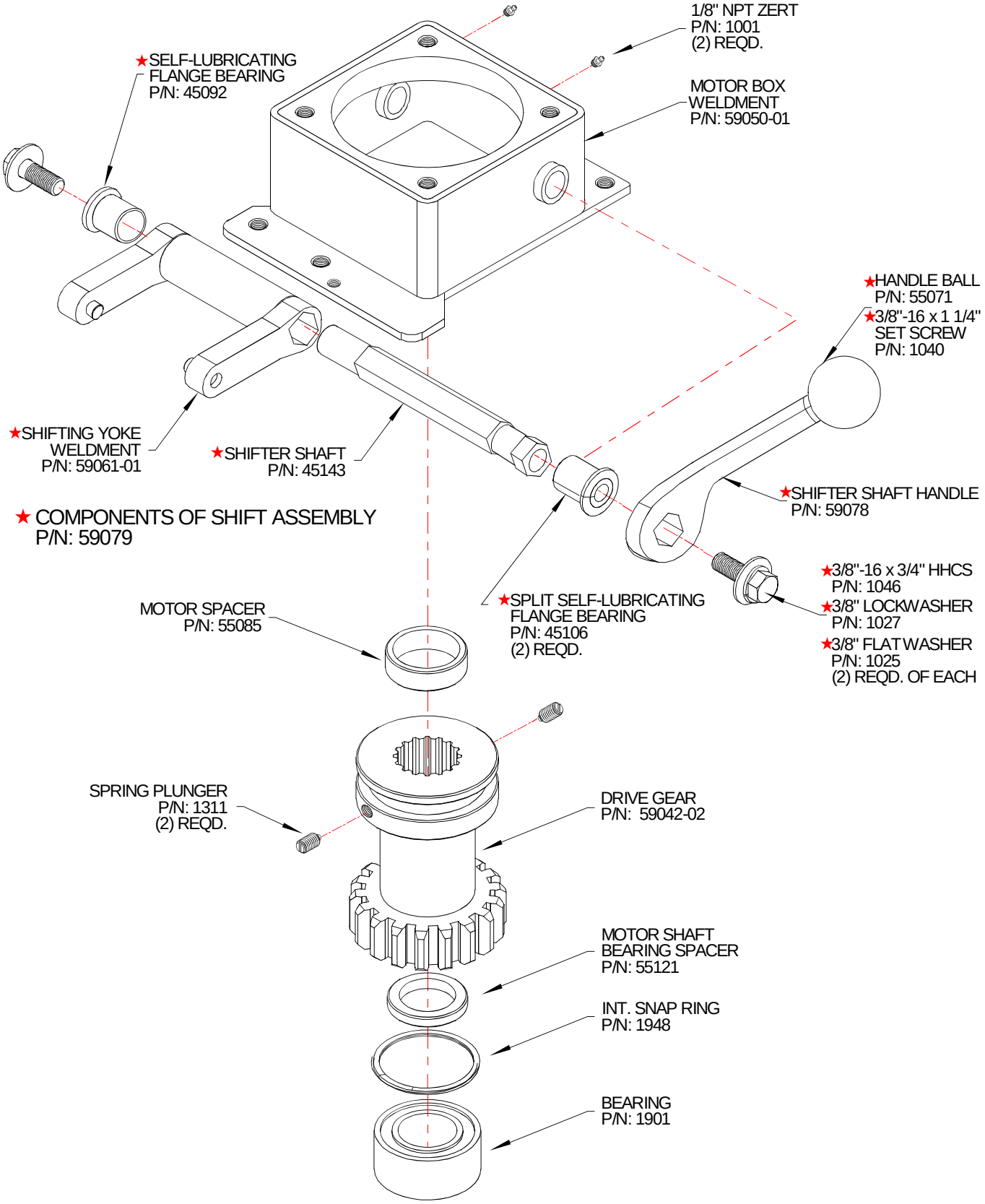

SHIFTING GEAR ASSEMBLY

2nd GENERATION
Model CLE5500XHT01

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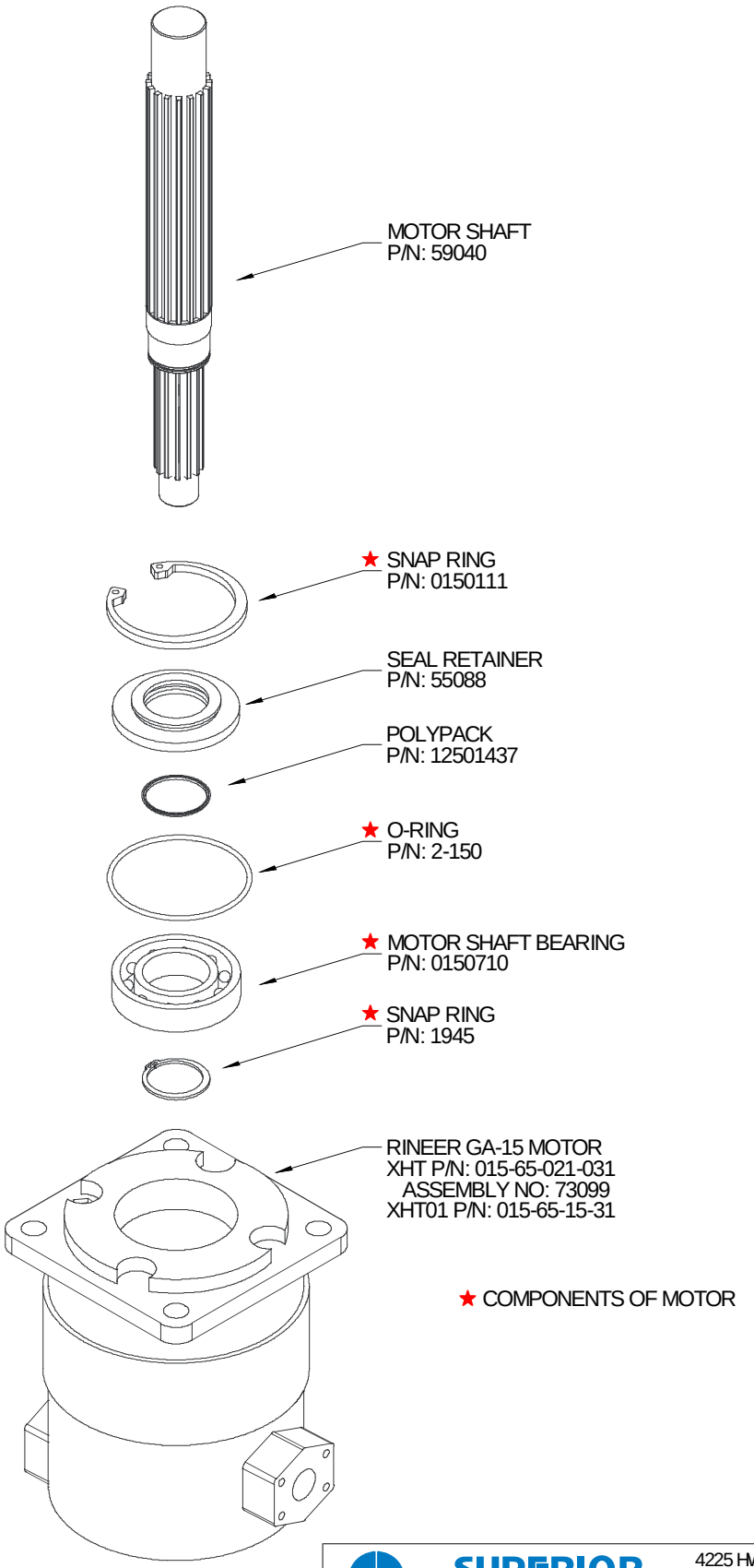
REV. #	LOG #	DATE
1		05/17/07

REF: P:\Manuals\Equip Manuals\Dwgs\CLE5500XHT\Shifting Gear 2nd rev1.wpg



MOTOR ASSEMBLY

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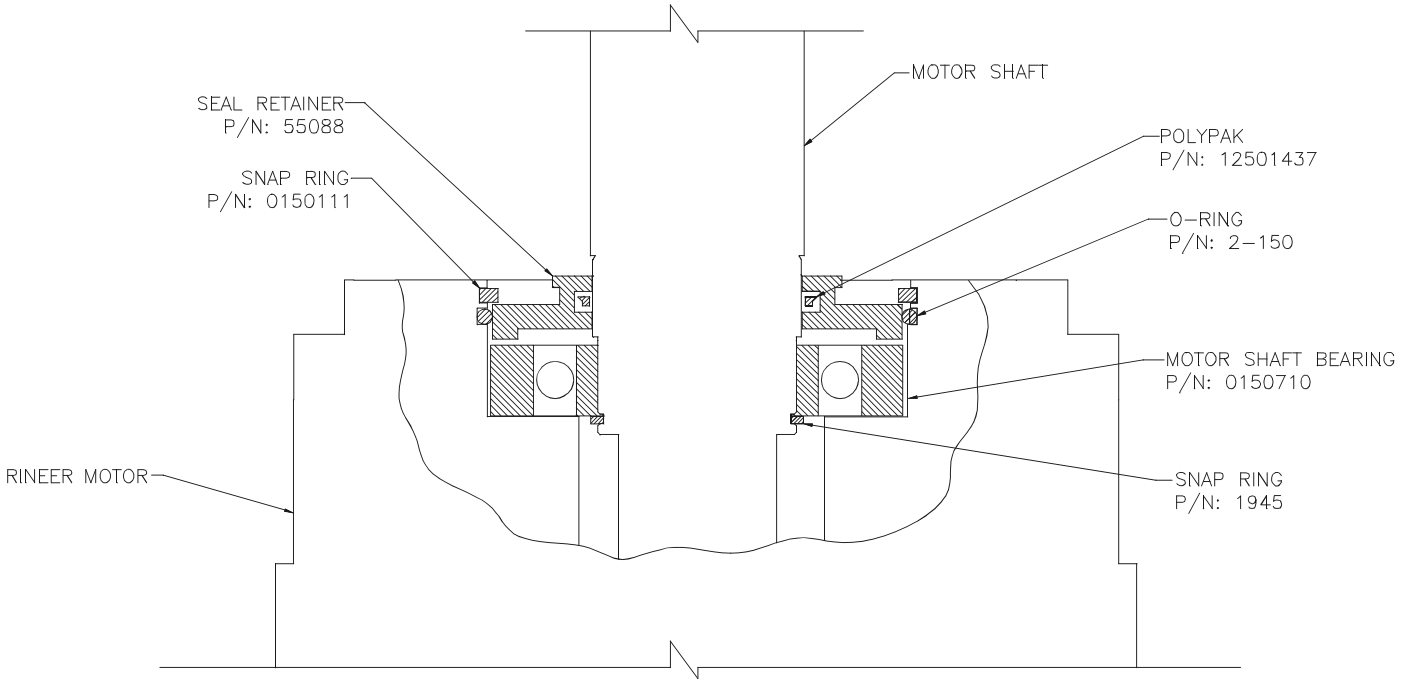
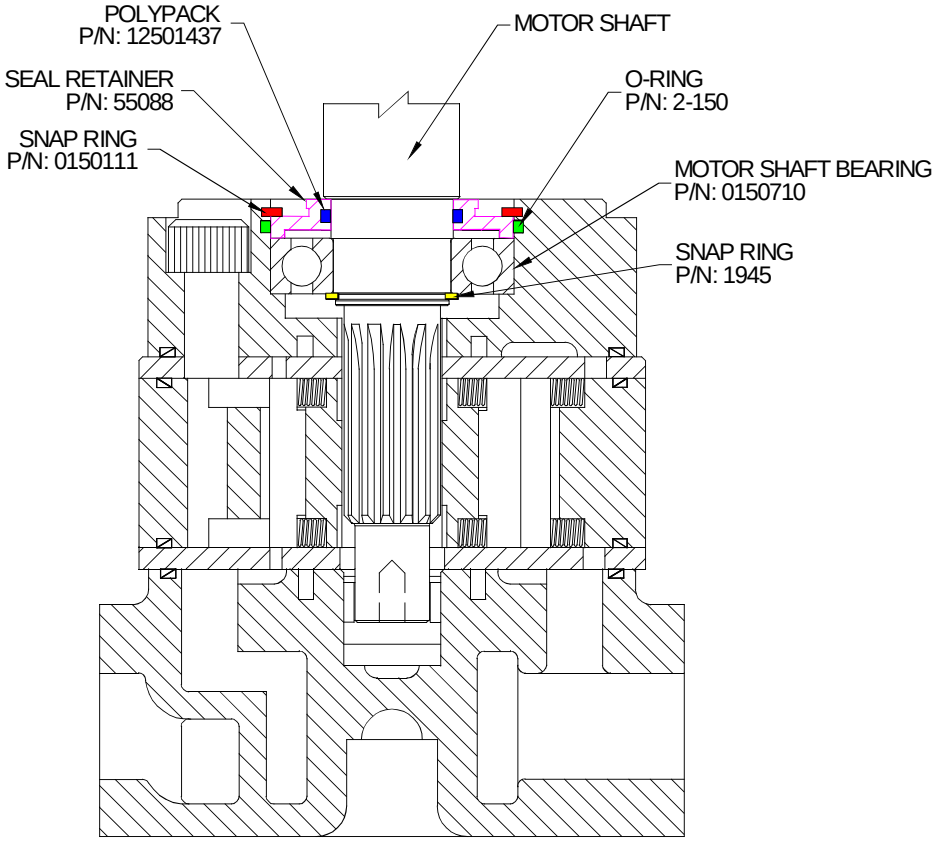
		08/14/02
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLE5500XHT\Motor.wpg





W/ OUT WIPER RING

MOTOR ASSEMBLY

FOR CLARITY PURPOSE ONLY
NOT TO SCALE

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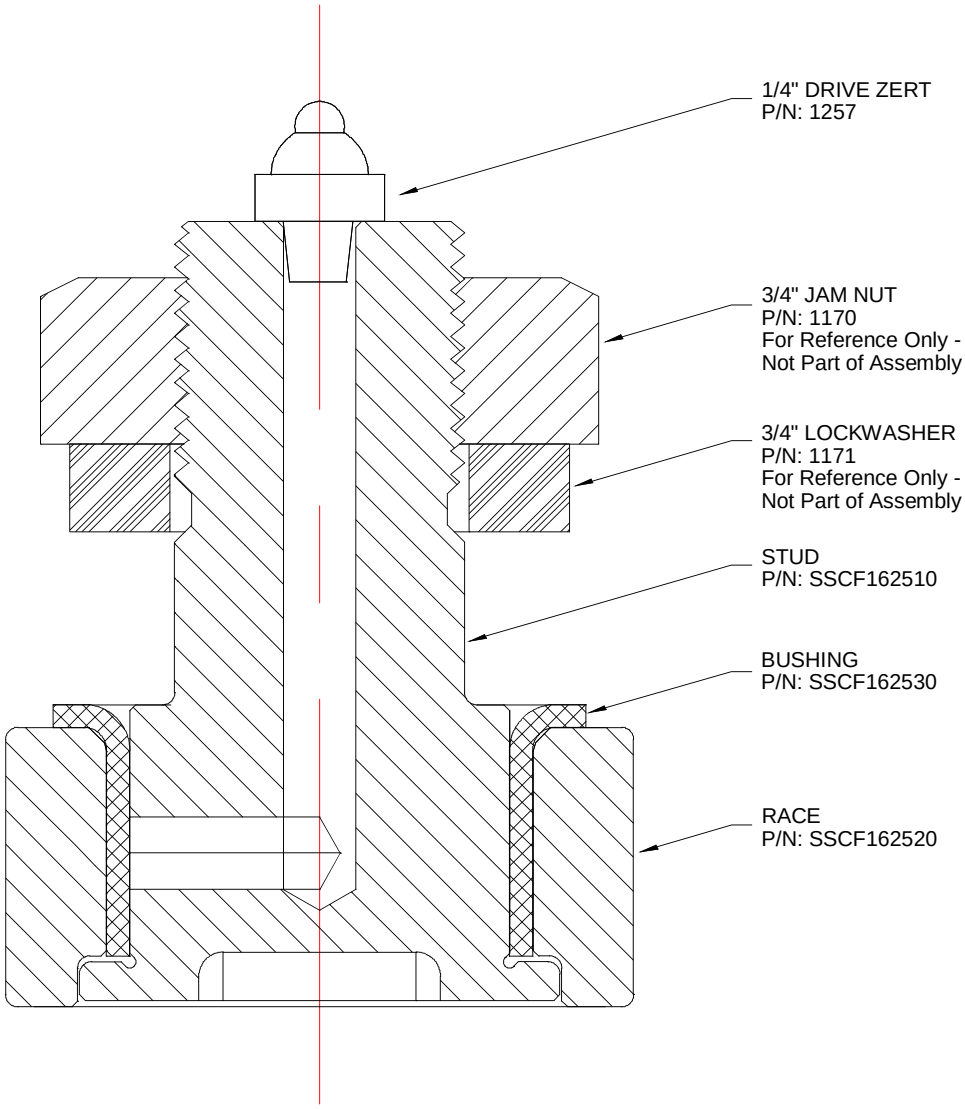
REV. #	LOG #	DATE
1		09/03/02

REF: P:\Manuals\Equip Manuals\Dwgs\Motor\Motor CLE5500+ sht2 rev1.wpg



1.625" SEVERE SERVICE CAM FOLLOWER ASSEMBLY

ASSEMBLY NO. SSCF162500

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		11/12/01
REV. #	LOG #	DATE

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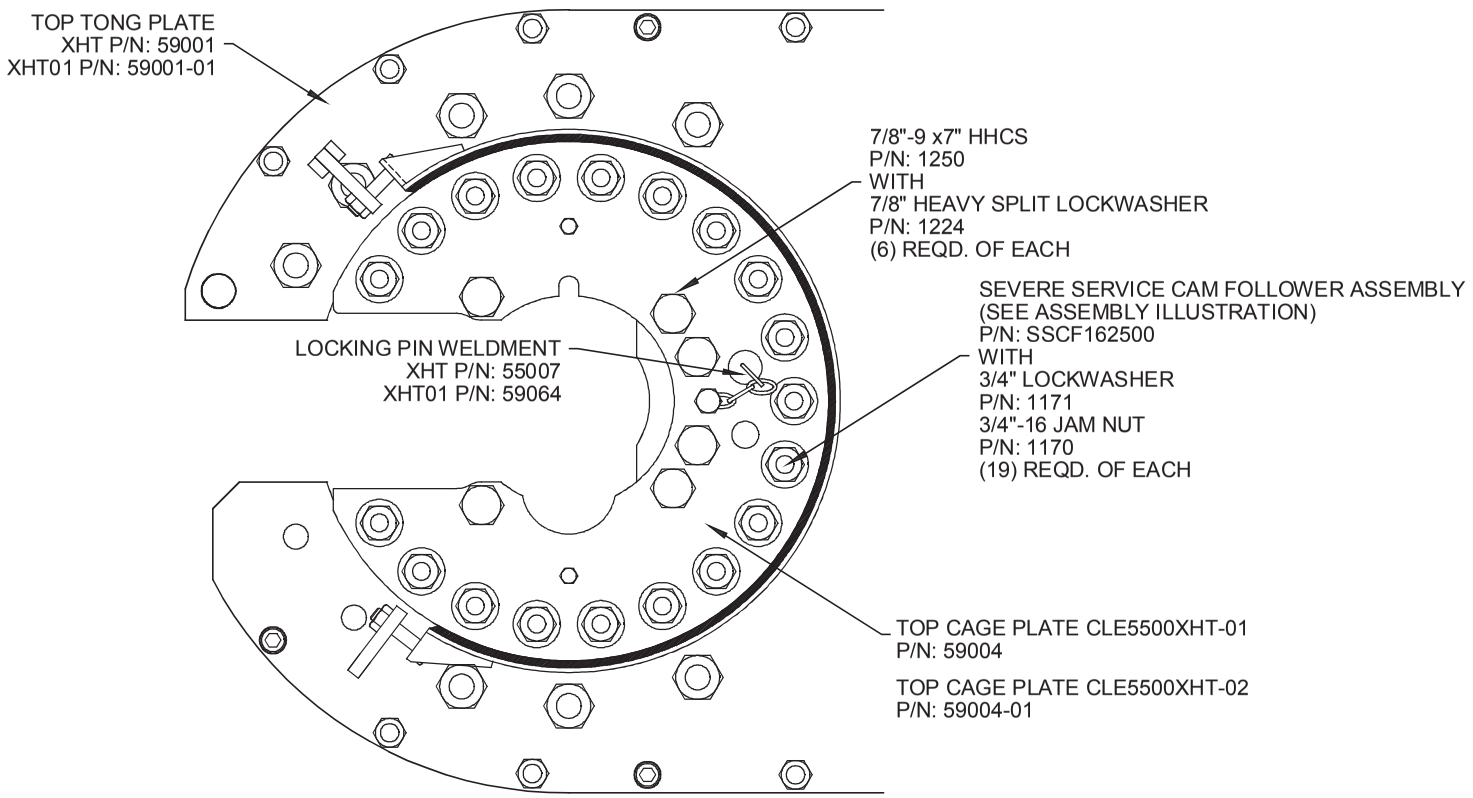

NOTE: ILLUSTRATION SHOWN WITHOUT
TONG DOOR & DOOR SAFETY SWITCH

TOP CAGE PLATE ASSEMBLY

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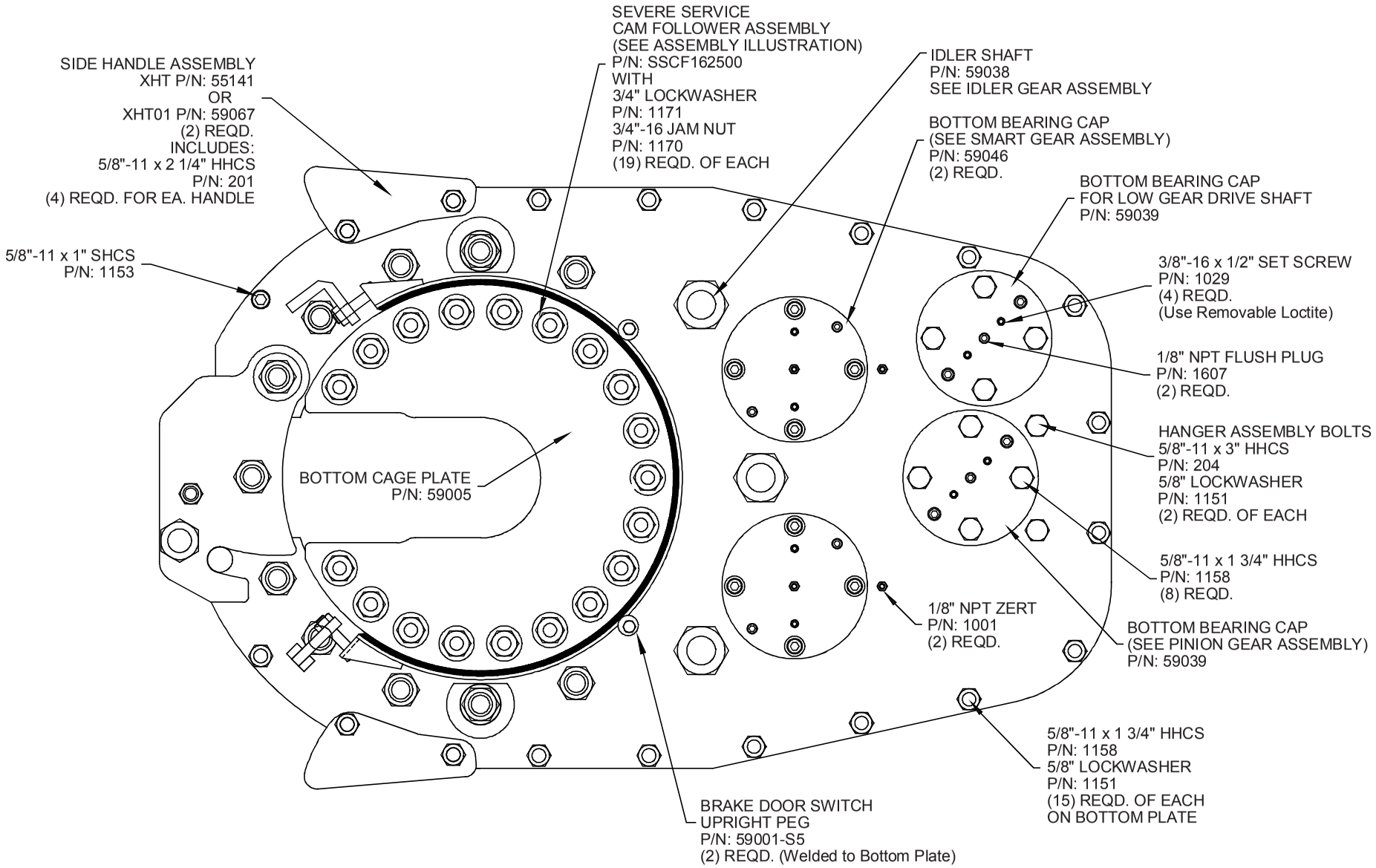
REV. #	LOG #	DATE
		6/9/09



BOTTOM VIEW

CLE5500XHT & 01
WITHOUT LEGS

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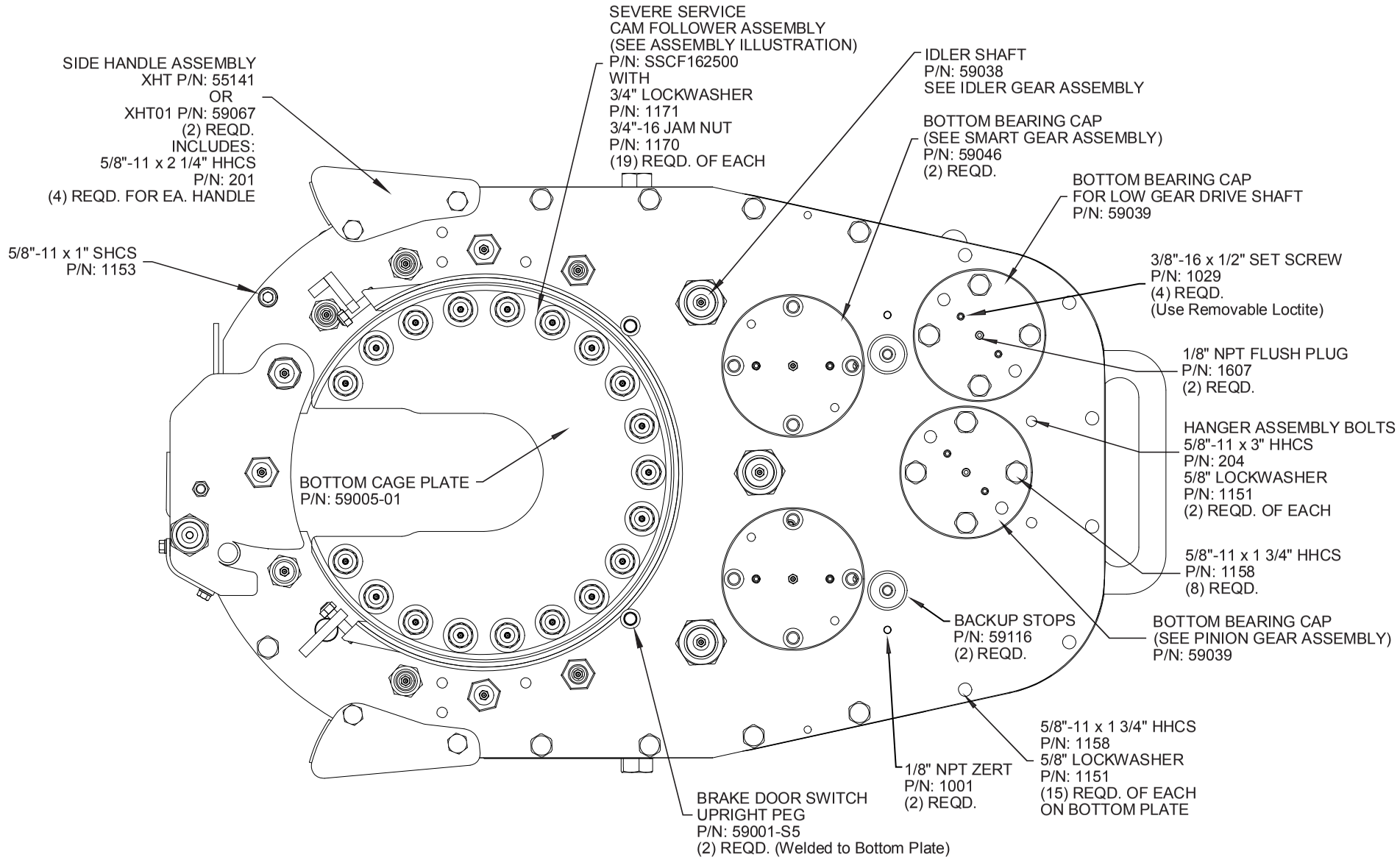
2		05/17/07
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLE5500XHT\Bottom View rev2.wpg



BOTTOM VIEW

CLE5500XHT02
WITHOUT LEGS

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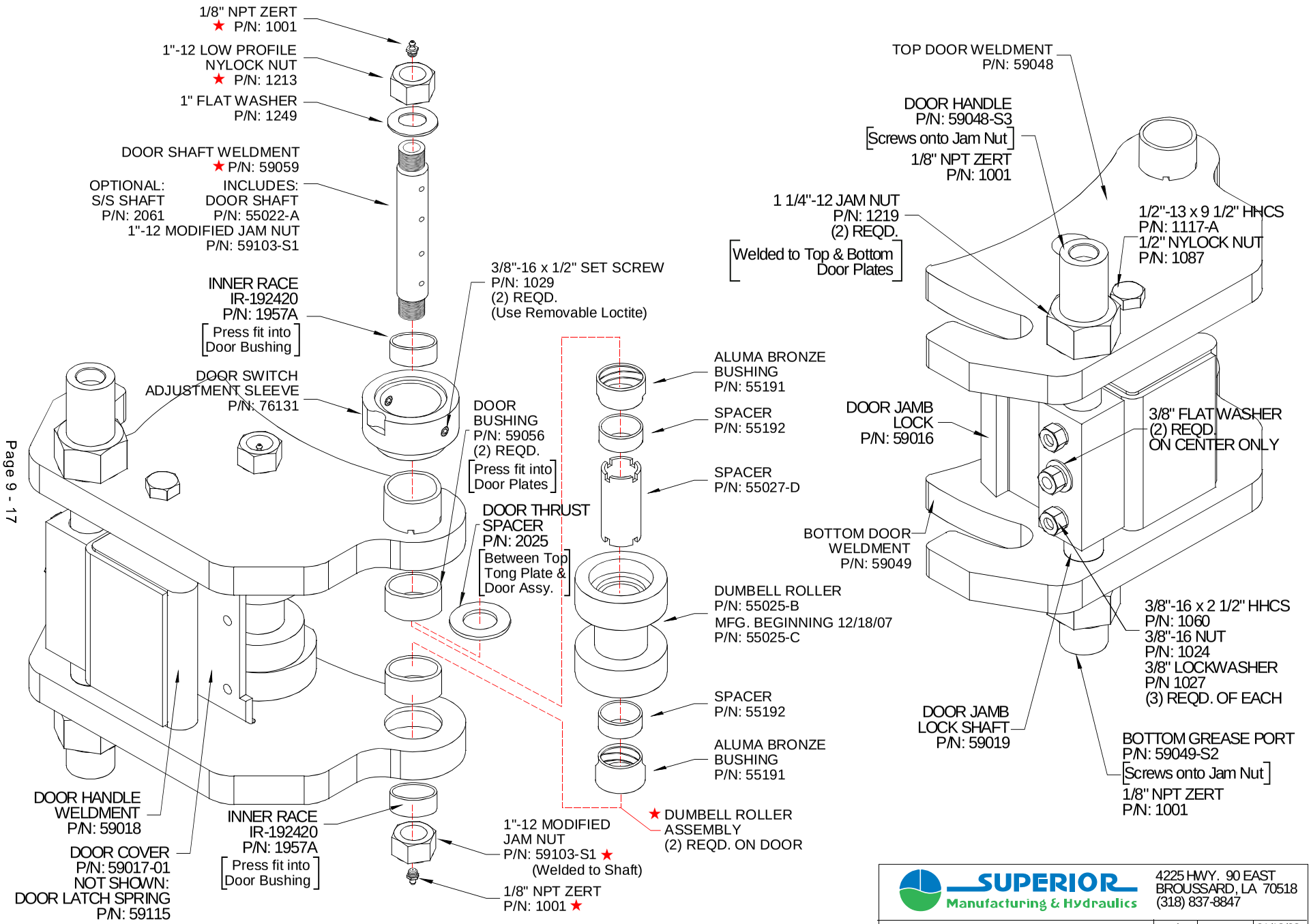
REV. #	LOG #	DATE



TONG DOOR ASSEMBLY

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REV. #	LOG #	DATE
4		01/18/08

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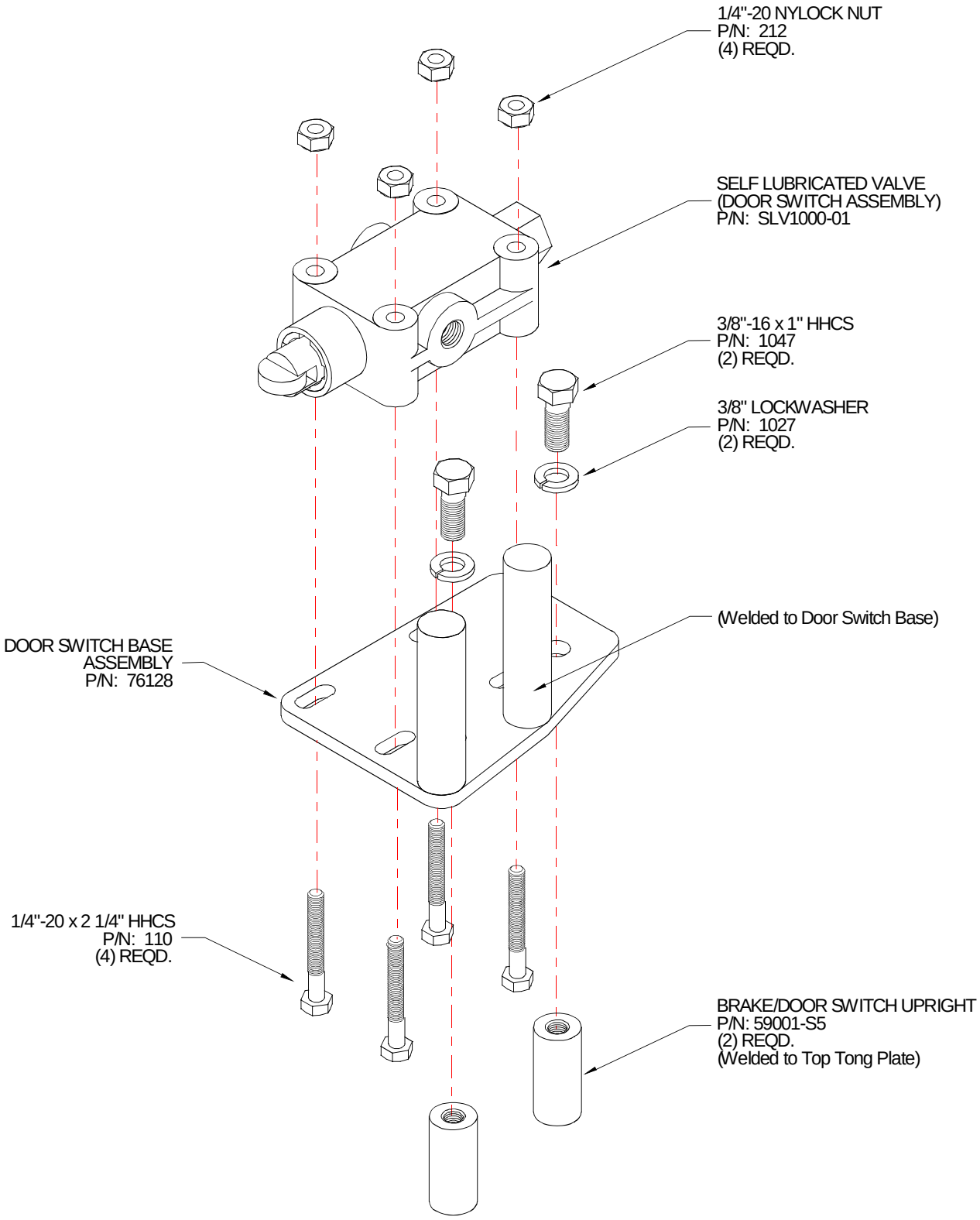

DOOR SWITCH ASSEMBLY

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REV. #	LOG #	DATE
1		02/25/04

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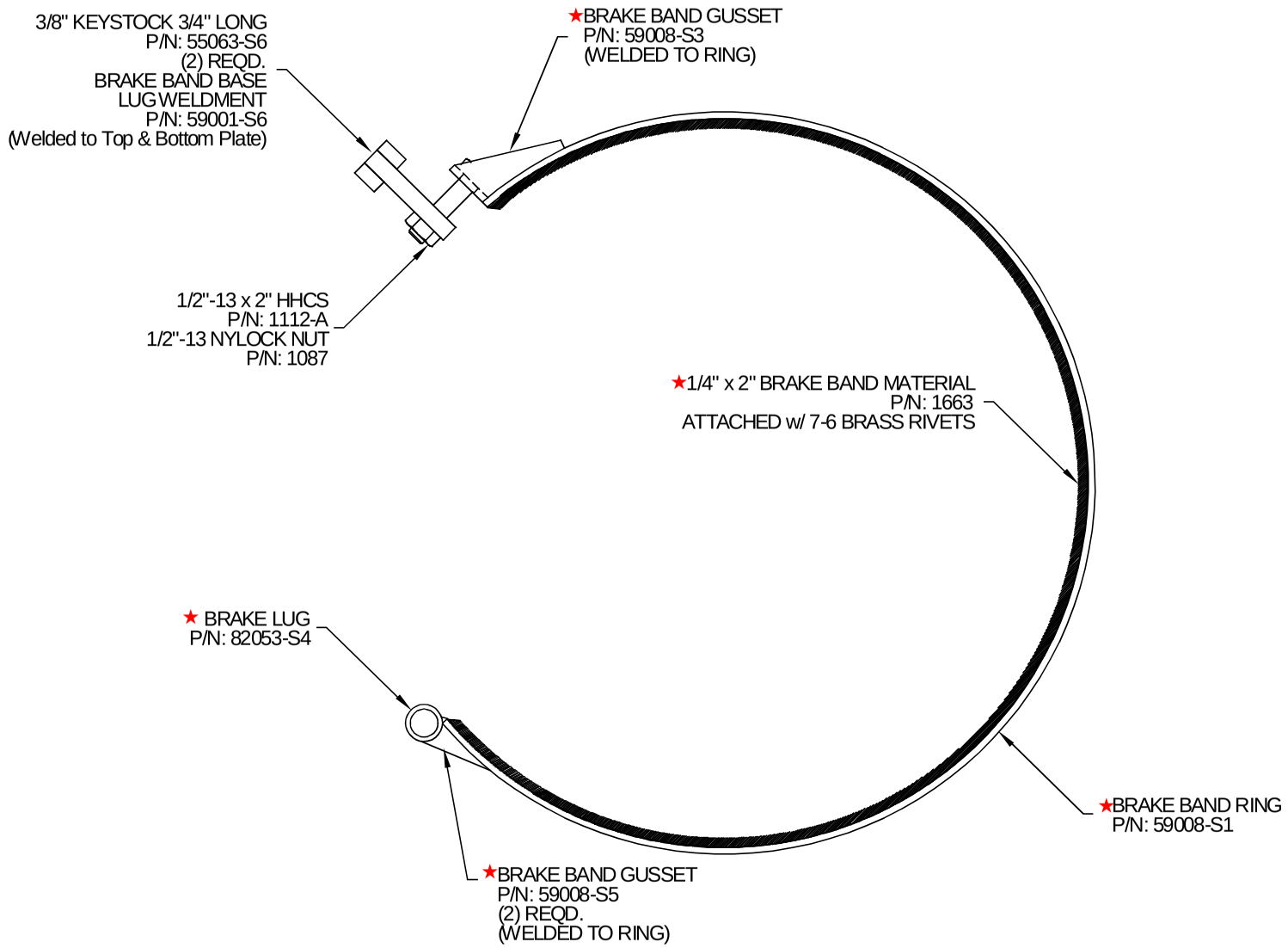

BRAKE BAND ASSEMBLY

MODEL XHT ASSEMBLY NUMBER 59008 ★

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REV. #	LOG #	DATE
		09/03/02

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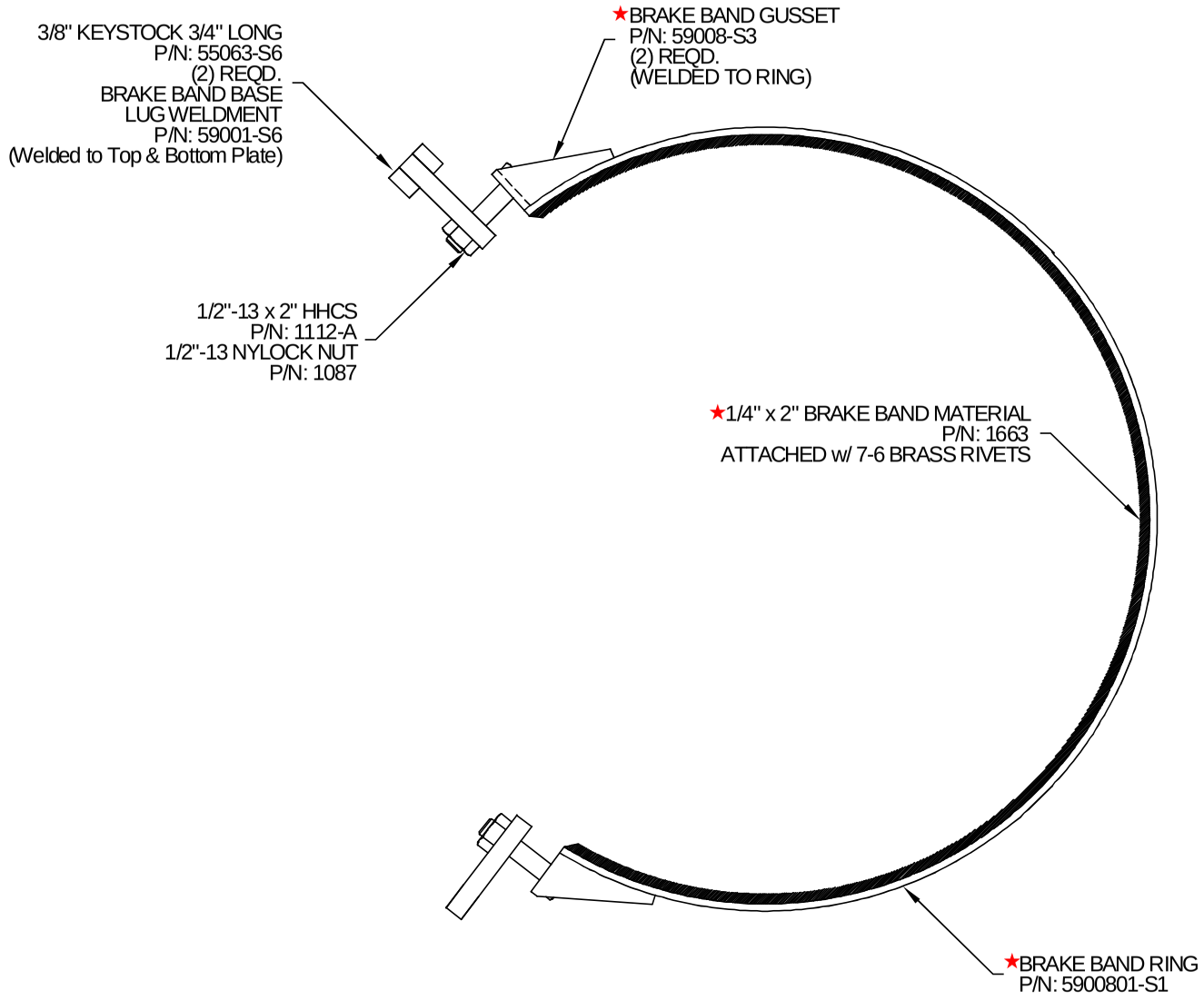

BRAKE BAND ASSEMBLY

MODEL XHT01 ASSEMBLY NUMBER 59008-01 ★

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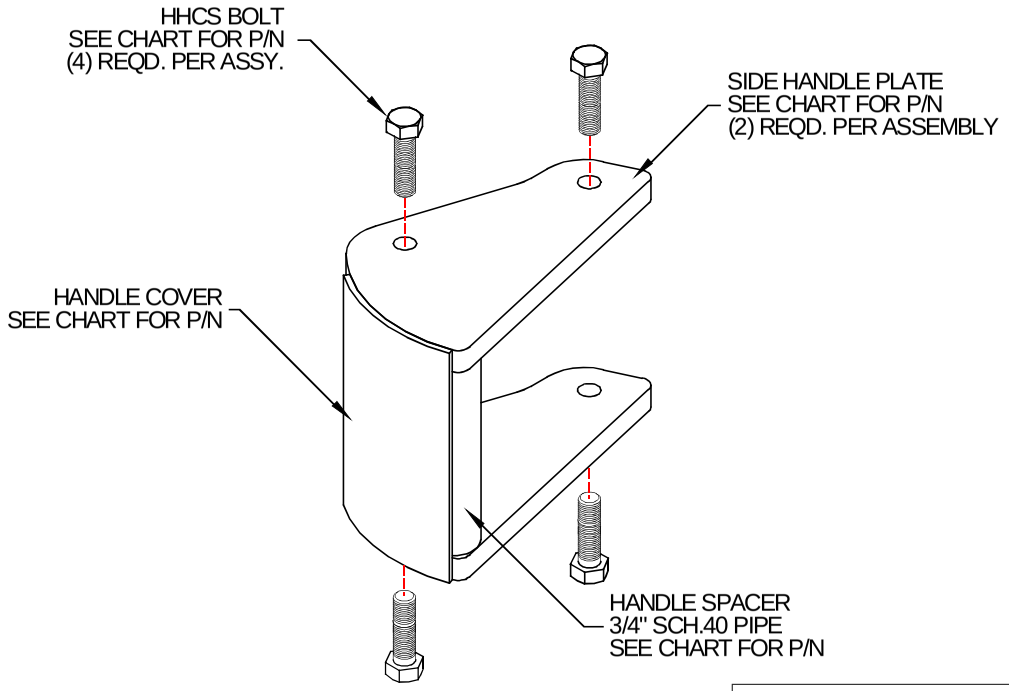
		09/03/02
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLE5500XHT\Brake Band XHT01.wpg

TONG	ASSEMBLY NUMBER	HANDLE SPACER PIPE PART NO.	HANDLE COVER PLATE PART NO.	SIDE HANDLE PLATE PART NO.	HHCS BOLT	
					PART NO.	SIZE
4 1/2 STANDARD	41111	41111-S1	41111-S2	45121	1055	3/8"-16 x 2 1/4"
5 1/2 STANDARD	51111	51111-S1	51111-S2	45119	1055	3/8"-16 x 2 1/4"
5 1/2 LOCKJAW	58086	51111-S1	51111-S2	45121	1055	3/8"-16 x 2 1/4"
5 1/2 UHT & XHT	55141	73017-S1	55141-S2	55200	201	5/8"-11 x 2 1/4"
5 1/2 XHT01	59067	73017-S1	73017-S2	59067-S1	201	5/8"-11 x 2 1/4"
7 5/8 STANDARD	76133	73017-S1	55141-S2	55200	201	5/8"-11 x 2 1/4"
7 5/8 DRILL PIPE -35	73017	73017-S1	73017-S2	14035	201	5/8"-11 x 2 1/4"
7 5/8 LOCKJAW	(2) 73095	73095-S1	73095-S2	14035-01	201	5/8"-11 x 2 1/4"
7 5/8 & 8 5/8 DRILL PIPE -60 & -03	(1) 74095	73095-S1	73095-S2	14035-02	201	5/8"-11 x 2 1/4"



SIDE HANDLE ASSEMBLY

SEE CHART FOR ASSEMBLY NUMBER

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REV. #	LOG #	DATE
6		10/24/03

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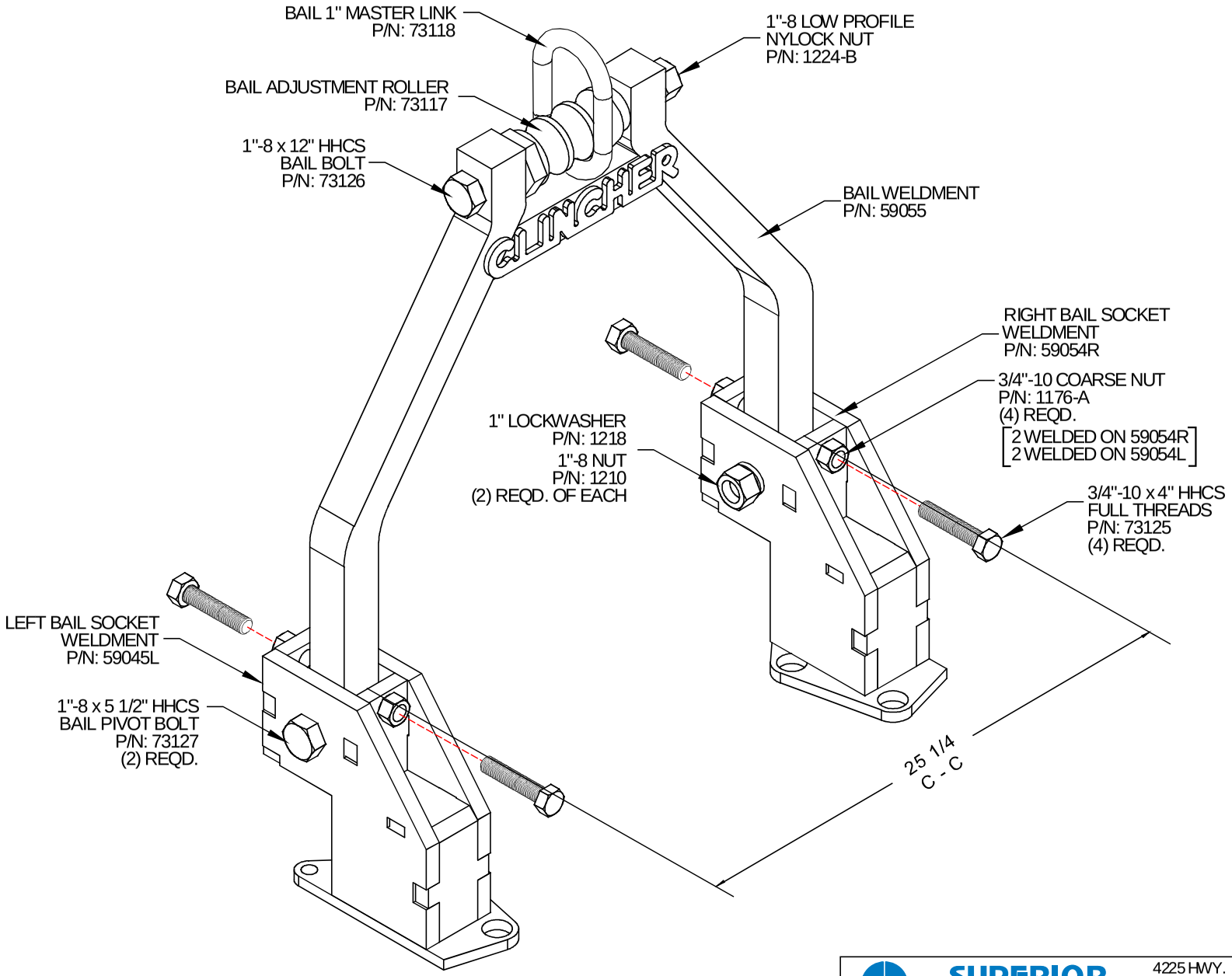

BAIL ASSEMBLY

ASSEMBLY NUMBER 59090

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		08/16/02
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLE5500XHT\Bail Assy.wpg

5 1/2" SPLINED JAW ASSEMBLY NO. CJ-59B

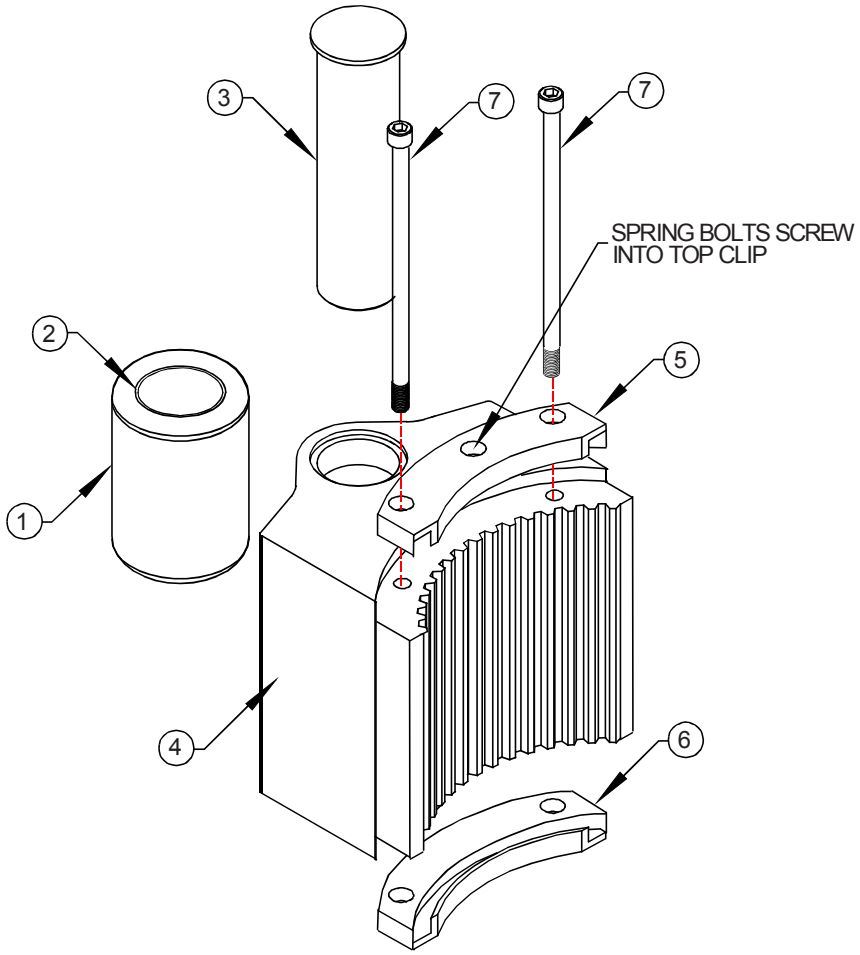
Item	Qty.	Part Number	Description
1	2	59027	JAW ROLLER
2	--	-----	-----
3	2	59028	JAW PIN
4	2	59074	3 1/2" TO 5 1/2" SPLINED JAW
5	2	59107	TOP CLIP
6	2	59108	BOTTOM CLIP
7	4	1186-M	1/4"-20 x 5 5/8" SHCS

USES CLJ5501-XXXXX STEEL DIES
USES BB5601-XXXXX **GRIT FACE™** DIES

5 1/2" SPLINED LOW FRICTION JAW ASSEMBLY NO. CJ-LF-59B

Item	Qty.	Part Number	Description
1	2	59027-01	LOW FRICTION JAW ROLLER
2	8	30DU16	BUSHING 1 7/8" ID x 1"
3	2	59028-01	LOW FRICTION JAW PIN
4	2	59074-01	2 7/8" TO 5 1/2" LF SPLINED JAW
5	2	59107	TOP CLIP
6	2	59108	BOTTOM CLIP
7	4	1186-M	1/4"-20 x 5 5/8" SHCS

USES CLJ5501-XXXXX STEEL DIES
USES BB5601-XXXXX **GRIT FACE™** DIES



5 1/2" XHT TONG SPLINED JAW ASSEMBLY

3 1/2" thru 5 1/2" XHT Assy. No. CJ-59B
2 7/8" thru 5 1/2" XHT LF Assy. No. CJ-LF-59B

(2) Required
(Right & Left Jaw are reversible and interchangeable)

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2		05/18/07

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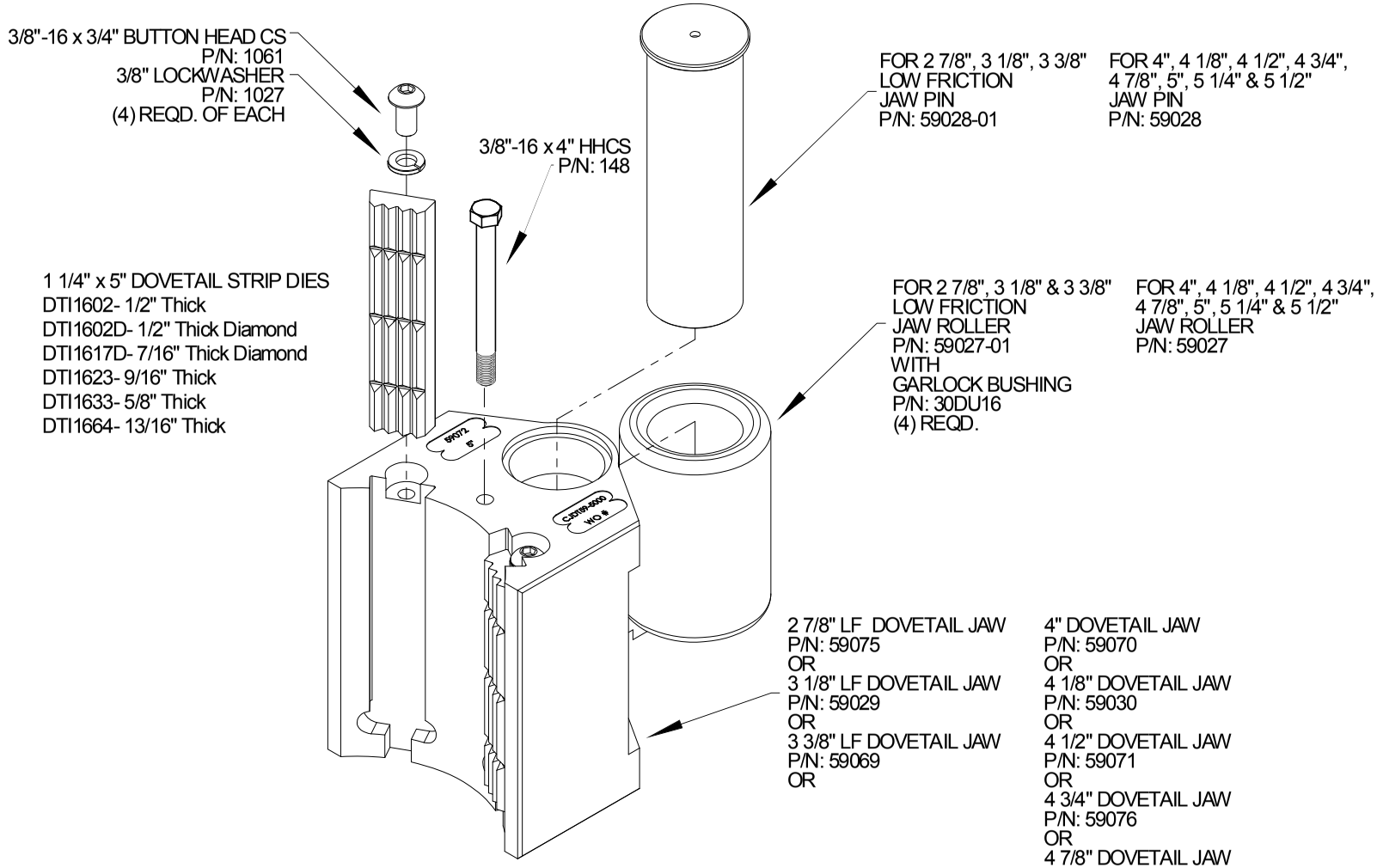

5 1/2" XHT TONG

DOVETAIL JAW ASSEMBLY

2 7/8" Assembly No. CJDT59-2875
3 1/8" Assembly No. CJDT59-3125
3 3/8" Assembly No. CJDT59-3375
4" Assembly No. CJDT59-4000
4 1/8" Assembly No. CJDT59-4125
4 1/2" Assembly No. CJDT59-4500
4 3/4" Assembly No. CJDT59-4750
4 7/8" Assembly No. CJDT59-4875
5" Assembly No. CJDT59-5000
5 1/4" Assembly No. CJDT59-5250
5 1/2" Assembly No. CJDT59-5500

(2) Required
(Right & Left Jaw are reversible and interchangeable)

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		04/15/09
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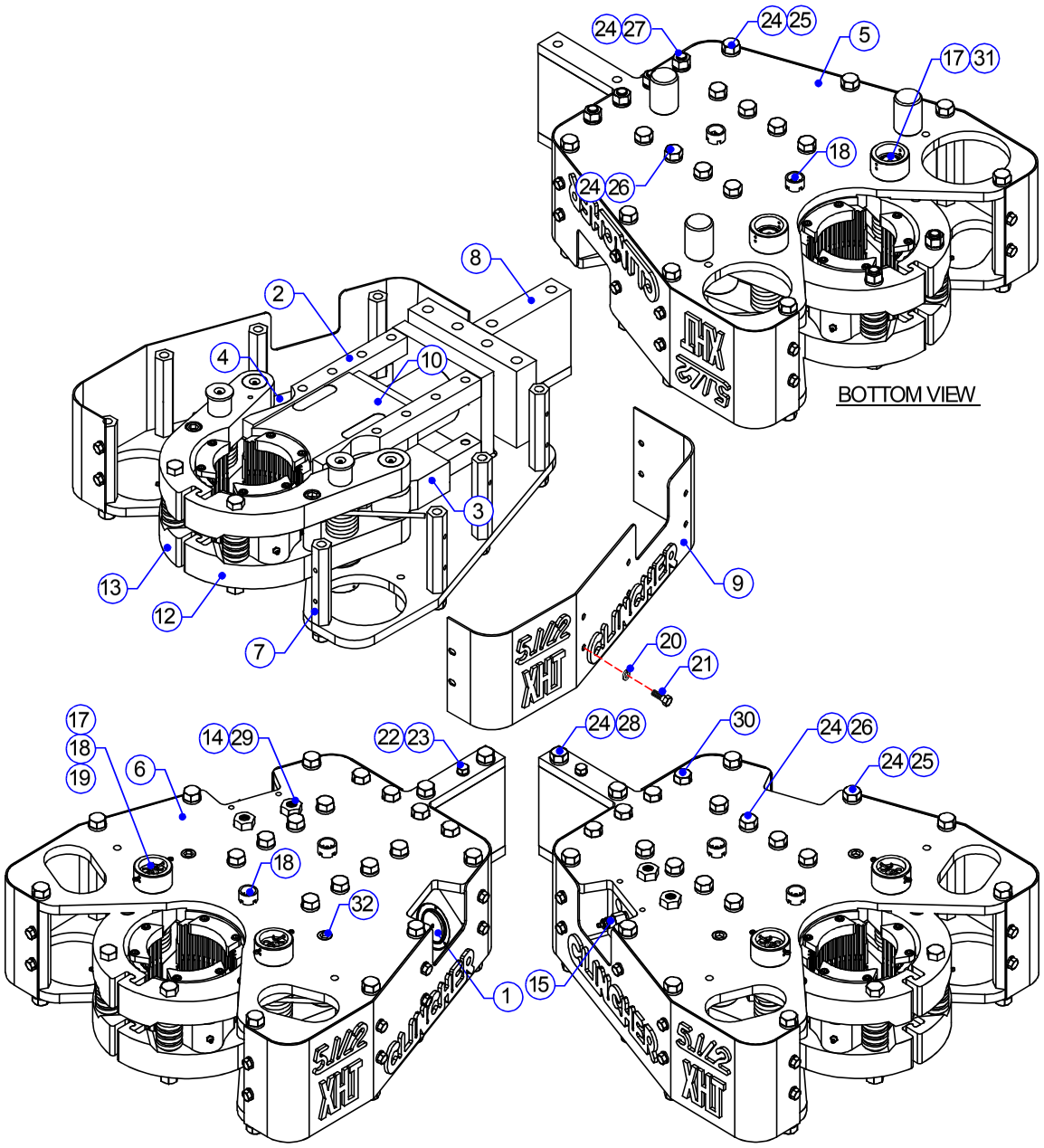
SECTION 10 LOCKJAW™ XHT DP BACKUP & MOUNTING KIT ILLUSTRATIONS

BUCD55XHT-01 / 5 1/2" **LOCKJAW™** XHT DP BACKUP ASSEMBLY ..... 10 - 2.1
BUCD55XHT-02 / 5 1/2" **LOCKJAW™** XHT DP BACKUP ASSEMBLY..... 10 - 2.2
BUCD55XHT / 5 1/2" **LOCKJAW™** XHT DP BACKUP ASSEMBLY..... 10 - 3
BUCD55XHT / 5 1/2" **LOCKJAW™** XHT DP BACKUP ASSEMBLY W/O TOP PLATE 10 - 4
BUCD55XHT / 5 1/2" **LOCKJAW™** XHT DP BACKUP TOP VIEW W/O TOP PLATE 10 - 5
CYLINDER ASSEMBLY *(Assembly No. BUCD5524)* ..... 10 - 6
INSIDE DOOR ASSEMBLY FOR BUCD55XHT *(Assembly No. BUCD5538)*..... 10 - 7
INSIDE DOOR ASSEMBLY FOR BUCD55XHT-02 *(Assembly No. BUCD5538-01)*.... 10 - 7.1
OUTSIDE DOOR ASSEMBLY FOR BUCD55XHT *(Assembly No. BUCD5537)*..... 10 - 8
OUTSIDE DOOR ASSEMBLY FOR BUCD55XHT-02 *(Assembly No. BUCD5537-01)* 10 - 8.1
DOVETAIL DIE ADAPTER..... 10 - 9
5 1/2" **LOCKJAW™** DP BACKUP MOUNTING KIT *(Assembly No. MK5900 & MK5900-01)* 10 - 10
5 1/2" **LOCKJAW™** DP BACKUP MOUNTING KIT *(Assembly No. MK5900-02)*..... 10 - 10.1
VALVE BANK ASSEMBLY..... 10 - 11
HYDRAULIC SCHEMATIC ..... 10 - 12
HYDRAULIC SCHEMATIC *(For CLE5500XHT-01, -02 with BUCD55XHT-01, -02)*.. 10 - 13



Item #	Qty.	Part Number	Part Description
1	1	BAC-5M25RCFF	GAUGE 0-5000 PSI
2	4	BUCD5503	CYLINDER GUIDE
3	1	BUCD5505	OUTSIDE DOOR WEDGE
4	1	BUCD5506	INSIDE DOOR WEDGE
5	1	BUCD5508-01	BOTTOM PLATE WELDMENT
6	1	BUCD5509-01	TOP PLATE WELDMENT
7	8	BUCD5510	SPACER
8	1	BUCD5521	LOAD CELL TAIL WELDMENT
9	1	BUCD5522-04	SIDE COVER ASSEMBLY
10	1	BUCD5524	CYLINDER ASSEMBLY
11	2	BUCD5532	DOOR SPRING RETAINER
12	1	BUCD5537	OUTSIDE DOOR ASSEMBLY
13	1	BUCD5538	INSIDE DOOR ASSEMBLY
14	2	BUCST7623	1/2" BULKHEAD CONNECTOR
15	1	BUCST7699	MANIFOLD ASSEMBLY
16	1	SLV1000-04	N.C. ORIG. SPOOL VALVE W/VENT
17	4	72025	BUSHING-24DU24 1 1/2" ID x 1 1/2"
18	6	1001	1/8" NPT ZERT
19	4	1005	3/16" x 1 1/2" COTTER PIN
20	20	1027	3/8" LOCK WASHER
21	20	1046	3/8"-16 x 3/4" HHCS
22	1	1103	1/2" LOCK WASHER
23	1	1111	1/2"-13 x 1" HHCS
24	38	1171	3/4" LOCK WASHER
25	16	1173	3/4"-10 x 1 3/4" HHCS
26	16	1174	3/4"-10 x 2 1/4" HHCS
27	4	1176-A	3/4"-10 HEX NUT
28	2	1184-A	3/4"-10 x 8 1/2" HHCS
29	2	1219	1 1/4"-12 JAM NUT
30	4	1256	3/4"-10 x 9 1/2" HHCS
31	2	1607	1/8" NPT FLUSH PLUG
32	2	1610	3/4" FLUSH PLUG
33	1	BUC5524-A	CHECK VALVE CARTRIDGE
34	1	BUC5524-B	P.O. CHECK VALVE ALUM. BODY
35	2	CM4565	1/4 NPT CHECK VALVE
36	1	CM7654	PSI REDUCING VALVE

NOT SHOWN IN THIS ILLUSTRATION
NUMEROUS HOSES & FITTINGS

5 1/2" XHT LOCKJAW™ DRILL PIPE BACKUP

ASSEMBLY NO. BUCD55XHT-01

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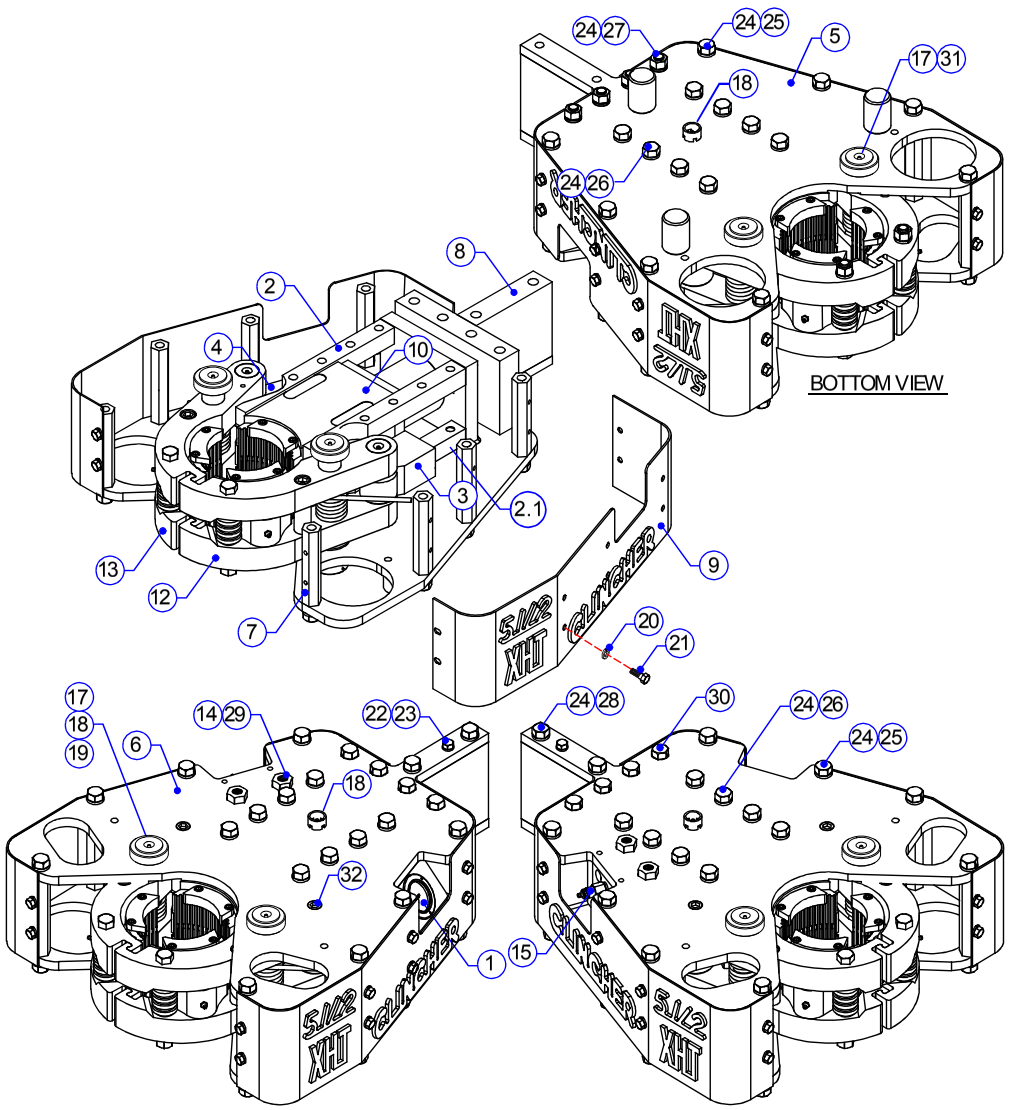

Item #	Qty.	Part Number	Part Description
1	1	BAC-5M25RCFF	GAUGE 0-5000 PSI
2	2	BUCD5503	CYLINDER GUIDE
2.1	2	BUCD5503-01	CYLINDER GUIDE
3	1	BUCD5505	OUTSIDE DOOR WEDGE
4	1	BUCD5506	INSIDE DOOR WEDGE
5	1	BUCD5508-02	BOTTOM PLATE WELDMENT
6	1	BUCD5509-02	TOP PLATE WELDMENT
7	8	BUCD5510	SPACER
8	1	BUCD5521	LOAD CELL TAIL WELDMENT
9	1	BUCD5522-04	SIDE COVER ASSEMBLY
10	1	BUCD5524	CYLINDER ASSEMBLY
11	2	BUCD5532 ☒	DOOR SPRING RETAINER
12	1	BUCD5537-01	OUTSIDE DOOR ASSEMBLY
13	1	BUCD5538-01	INSIDE DOOR ASSEMBLY
14	2	BUCST7623	1/2" BULKHEAD CONNECTOR
15	1	BUCST7699	MANIFOLD ASSEMBLY
16	1	SLV1000-04 ☒	N.C. ORIG. SPOOL VALVE W/VENT
17	2	BUCD5520-01	DOUBLER
18	6	1001	1/8" NPT ZERT
19	2	BUCD5516-01	PIVOT PIN
20	20	1027	3/8" LOCK WASHER
21	20	1046	3/8"-16 x 3/4" HHCS
22	1	1103	1/2" LOCK WASHER
23	1	1111	1/2"-13 x 1" HHCS
24	38	1171	3/4" LOCK WASHER
25	16	1173	3/4"-10 x 1 3/4" HHCS
26	16	1174	3/4"-10 x 2 1/4" HHCS
27	4	1176-A	3/4"-10 HEX NUT
28	2	1184-A	3/4"-10 x 8 1/2" HHCS
29	2	1219	1 1/4"-12 JAM NUT
30	4	1256	3/4"-10 x 9 1/2" HHCS
31	2	1927	SNAP RING
32	2	1610	3/4" FLUSH PLUG
33	1	BUC5524-A ☒	CHECK VALVE CARTRIDGE
34	1	BUC5524-B ☒	P.O. CHECK VALVE ALUM. BODY
35	2	CM4565 ☒	1/4 NPT CHECK VALVE
36	1	CM7654 ☒	PSI REDUCING VALVE

☒ NOT SHOWN IN THIS ILLUSTRATION
☒ NUMEROUS HOSES & FITTINGS

5 1/2" XHT LOCKJAW™ DRILL PIPE BACKUP

ASSEMBLY NO. BUCD55XHT-02

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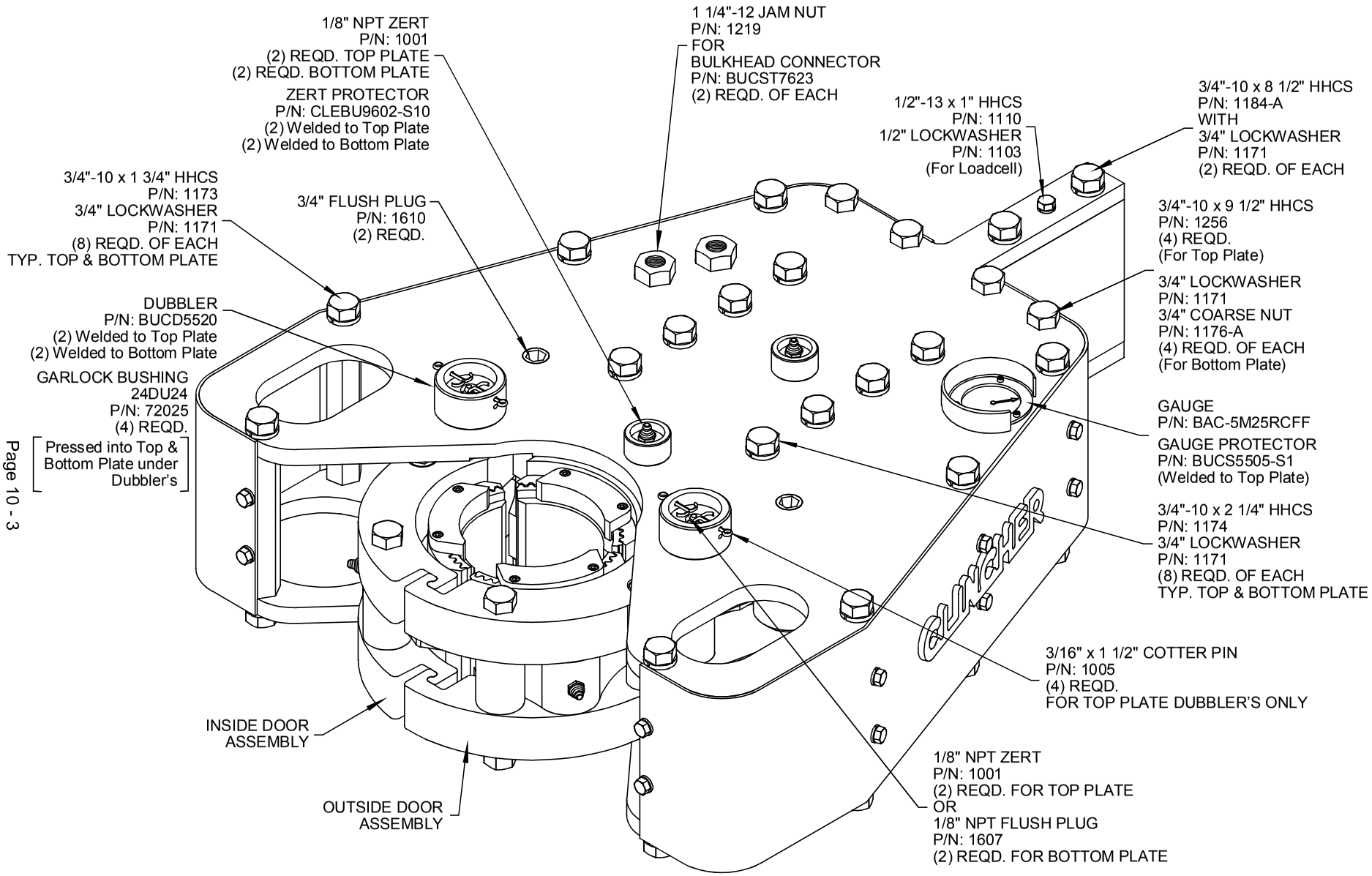

5 1/2" XHT LOCKJAW™ DRILL PIPE BACKUP

ASSEMBLY NO. BUCD55XHT

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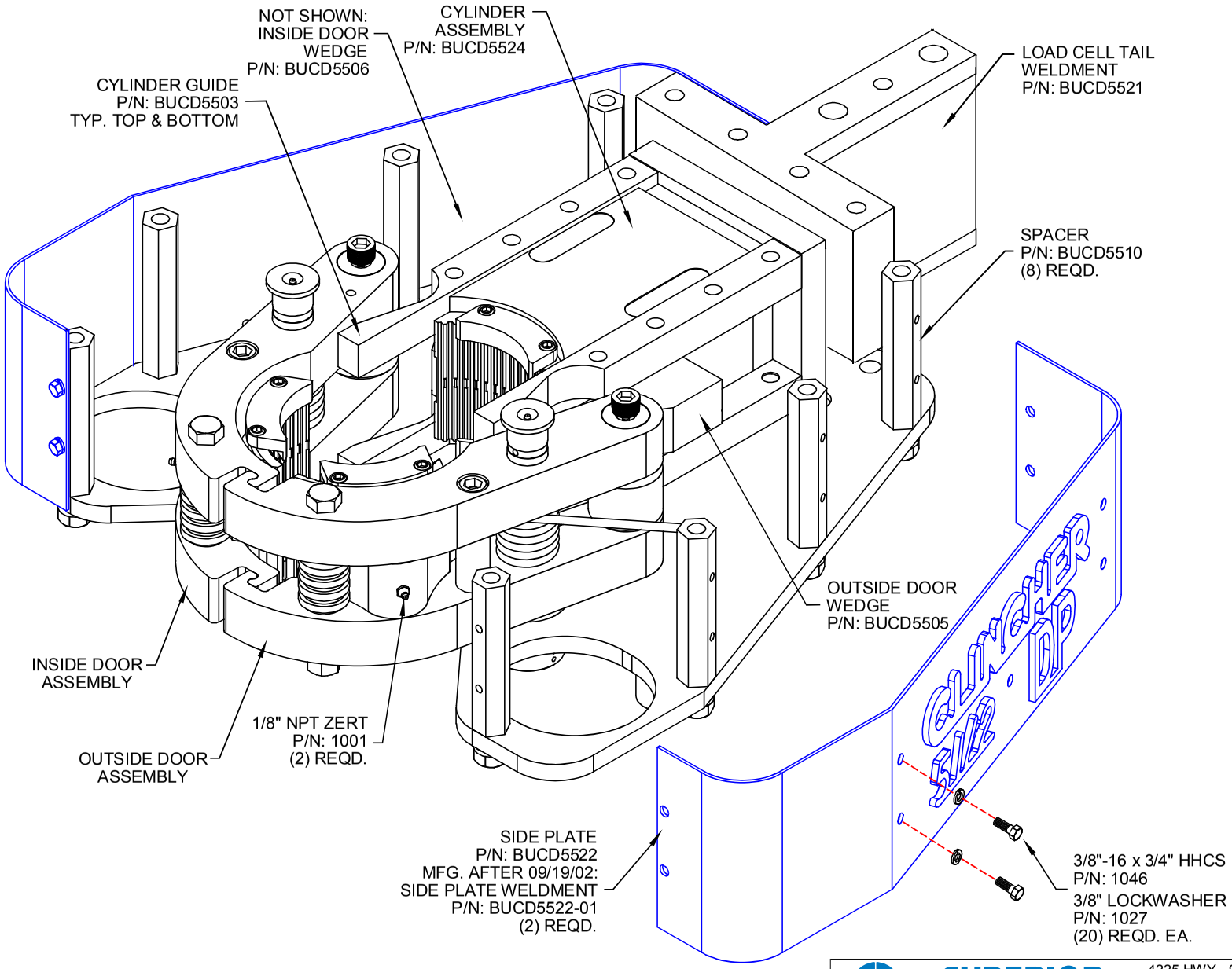

5 1/2" LOCKJAW™ DRILL PIPE BACKUP

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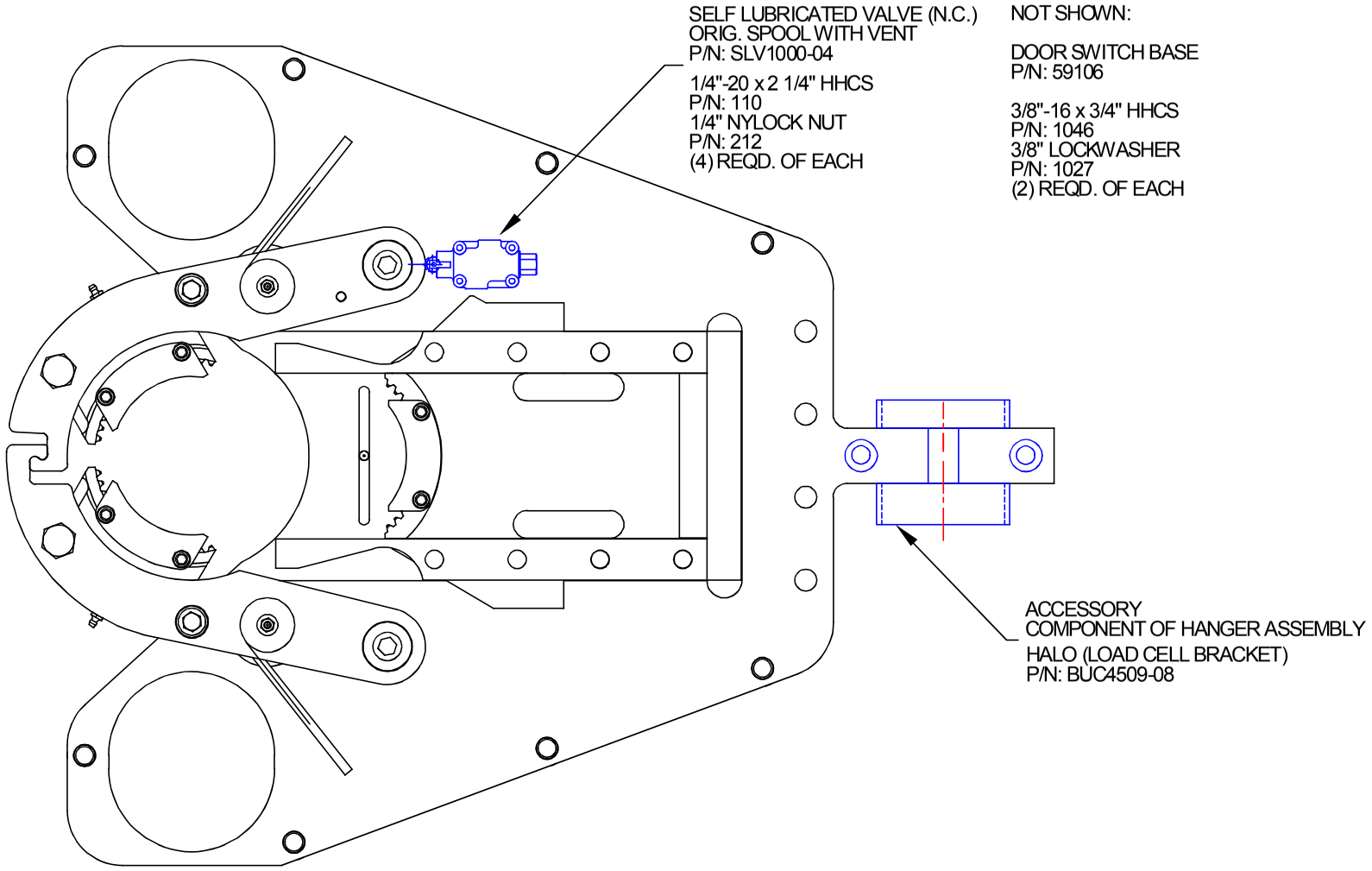
REV. #	LOG #	DATE
2		03/15/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD5500\Assy woPlate rev2.wpg



5 1/2" LOCKJAW™ DRILL PIPE BACKUP

TOP VIEW WITHOUT TOP PLATE

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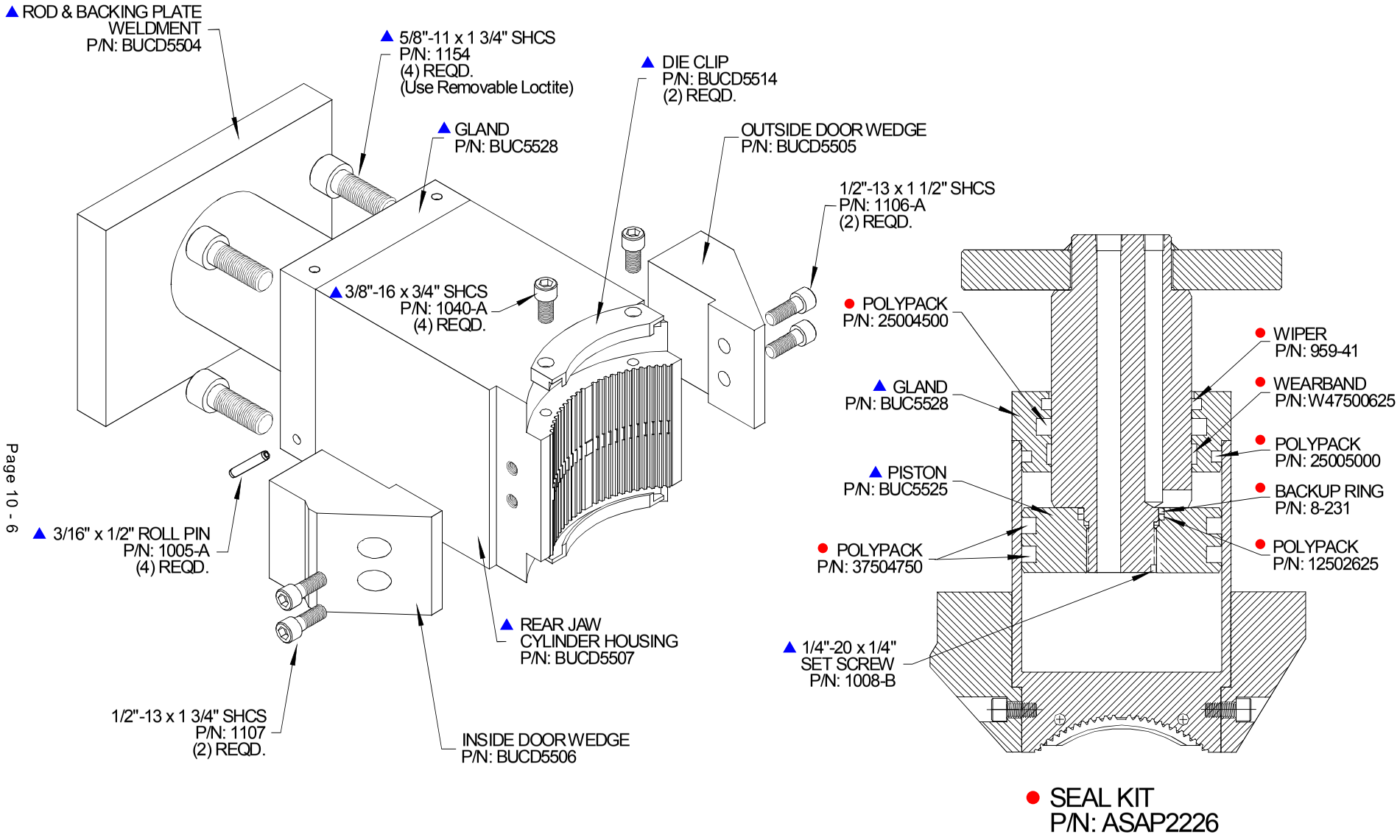
REV. #	LOG #	DATE
2		03/15/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD5500\Top View woPlate rev2.wpg


▲ ROD & BACKING PLATE WELDMENT P/N: BUCD5504
▲ 5/8"-11 x 1 3/4" SHCS P/N: 1154 (4) REQD. (Use Removable Loctite)
▲ DIE CLIP P/N: BUCD5514 (2) REQD.
▲ GLAND P/N: BUC5528
OUTSIDE DOOR WEDGE P/N: BUCD5505
1/2"-13 x 1 1/2" SHCS P/N: 1106-A (2) REQD.
▲ 3/8"-16 x 3/4" SHCS P/N: 1040-A (4) REQD.
▲ 3/16" x 1/2" ROLL PIN P/N: 1005-A (4) REQD.
▲ REAR JAW CYLINDER HOUSING P/N: BUCD5507
1/2"-13 x 1 3/4" SHCS P/N: 1107 (2) REQD.
INSIDE DOOR WEDGE P/N: BUCD5506
● POLYPACK P/N: 25004500
● WIPER P/N: 959-41
▲ GLAND P/N: BUC5528
● WEARBAND P/N: W47500625
● POLYPACK P/N: 25005000
▲ PISTON P/N: BUC5525
● BACKUP RING P/N: 8-231
● POLYPACK P/N: 37504750
● POLYPACK P/N: 12502625
▲ 1/4"-20 x 1/4" SET SCREW P/N: 1008-B

● SEAL KIT
P/N: ASAP2226

5 1/2" LOCKJAW™ DRILL PIPE BACKUP

CYLINDER ASSEMBLY

ASSEMBLY NO. BUCD5524▲

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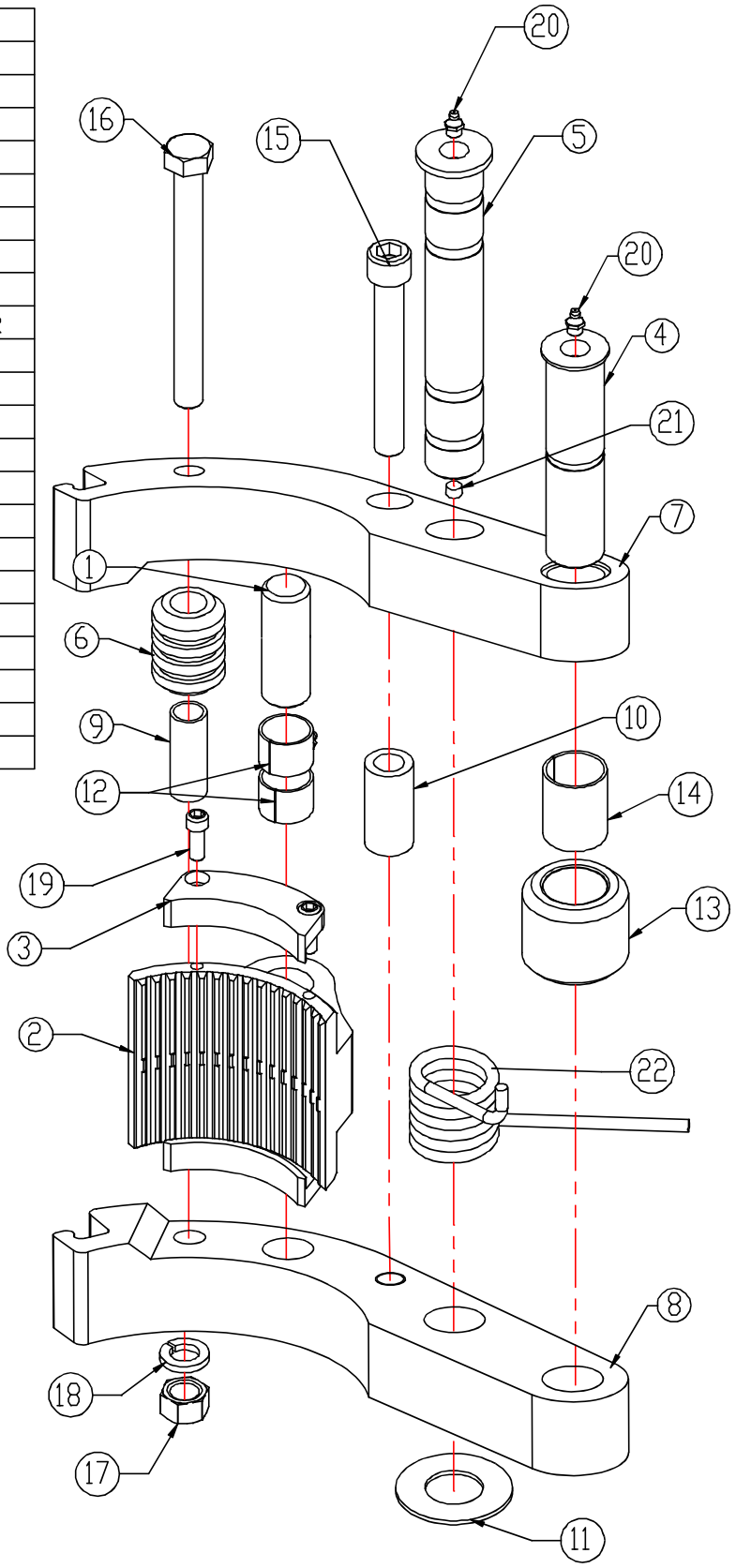
REV. #	LOG #	DATE
1		03/16/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD5500\BUCD5524 Cyl rev1.wpg

Item #	Qty.	Part Number	Part Name
1	1	BUCD5530 ⟨3⟩	INSERT PIN
2	1	BUCD5513	PIVOTING INSERT
3	2	BUCD5514	DIE CLIP
4	1	BUCD5515	ROLLER PIN
5	1	BUCD5516	PIVOT PIN
6	1	BUCD5523-01	GROOVED DOOR SPRING
7	1	BUCD5528	INSIDE DOOR TOP PLATE
8	1	BUCD5529	INSIDE DOOR BOTTOM PLATE
9	1	BUCD5541	FRONT DOOR SPRING SPACER
10	1	BUCDP8509	DOOR SPACER
11	1	2025	TONG DOOR THRUST SPACER
12	2	20DU16	DU BEARING 1 1/4" X 1"
13	1	BUCD5519	DOOR ROLLER
14	1	BUCS4027	DU BEARING 1 1/2" X 2"
15	1	1177-A	3/4"-10 X 5 1/2" SHCS
16	1	1255	HHCS 3/4"-10 X 7 1/2"
17	1	1176-A	3/4" GR. 8 NUT
18	1	1171	3/4" LOCKWASHER
19	4	1041	3/8-16x1 1/4 SHCS
20	3	1001	1/8 NPT ZERT
21	1	1607	1/8" FLUSH PLUG
22	1	BUCD5525	TORSION SPRING

⟨3⟩ 01/25/05 - Removed grease holes & groove.



INSIDE DOOR ASSEMBLY

FOR BUCD55XHT & -01

ASSEMBLY NO. BUCD5538

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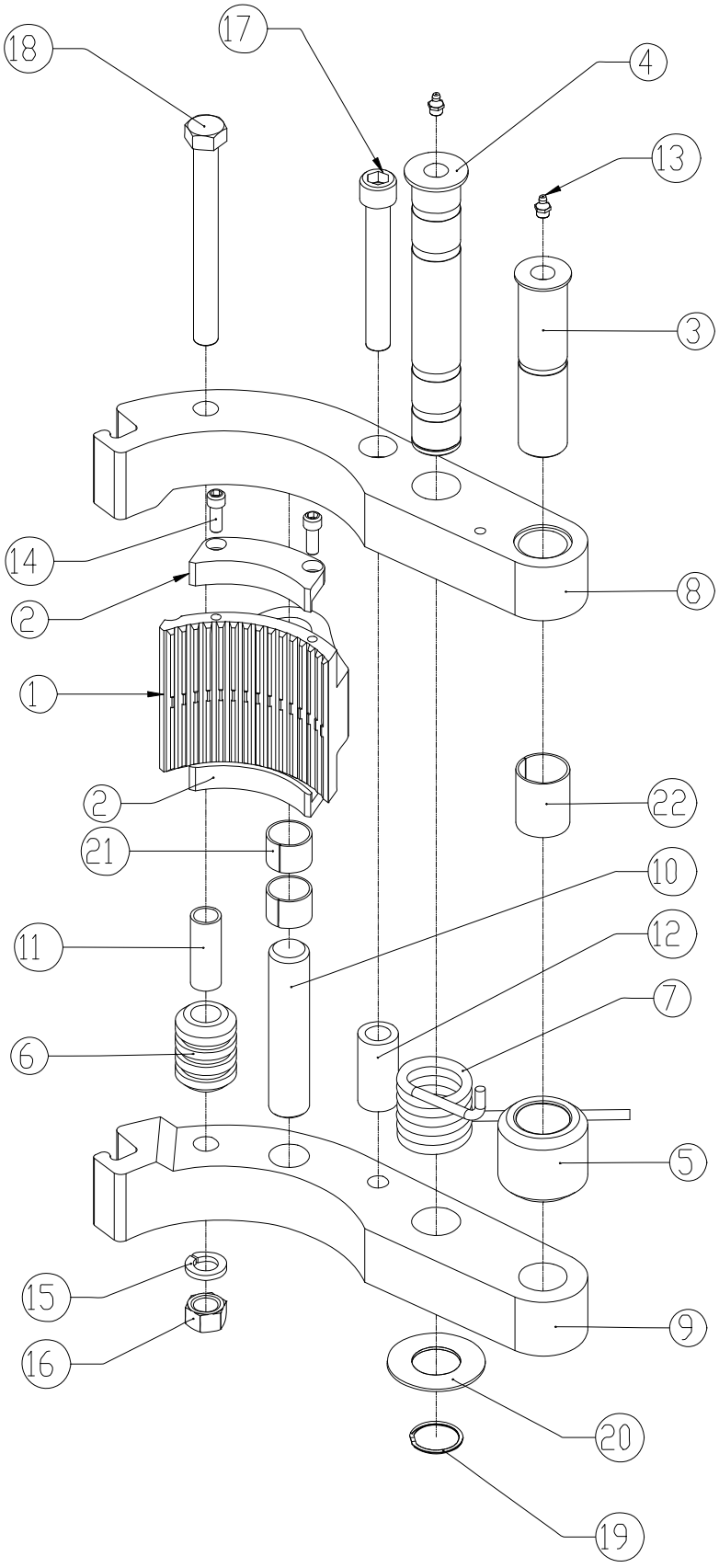
3		12/05/07
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD55XHT\BUCD5538 Door I rev3.wpg

Item #	Qty.	Part Number	Part Name
1	1	BUCD5513	PIVOTING INSERT
2	2	BUCD5514	DIE CLIP
3	1	BUCD5515	ROLLER PIN
4	1	BUCD5516-01	PIVOT PIN
5	1	BUCD5519	DOOR ROLLER
6	1	BUCD5523-01	GROOVED DOOR SPRING
7	1	BUCD5525	TORSION SPRING
8	1	BUCD5528	INSIDE TOP DOOR (XHT)
9	1	BUCD5529	INSIDE BOTTOM DOOR (XHT)
10	1	BUCD5530	INSERT PIN
11	1	BUCD5541	FRONT DOOR SPRING SPACER
12	1	BUCDP8509	DOOR SPACER
13	3	1001	1/8 NPT ZERT
14	4	1041	3/8-16x1 1/4 SHCS
15	1	1171	3/4" LOCKWASHER
16	1	1176-A	3/4" GR. 8 NUT
17	1	1177-A	3/4"-10 X 5 1/2" SHCS
18	1	1255	HHCS 3/4"-10 X 7 1/2"
19	1	1927	SPIROLOX RETAINING RING (RSN-150)
20	1	2025	TONG DOOR THRUST SPACER
21	2	20DU16	GARLOCK
22	1	24DU32	1 1/2" X2" DU BEARING



INSIDE DOOR ASSEMBLY

FOR BUC55XHT-02
ASSEMBLY NO. BUCD5538-01

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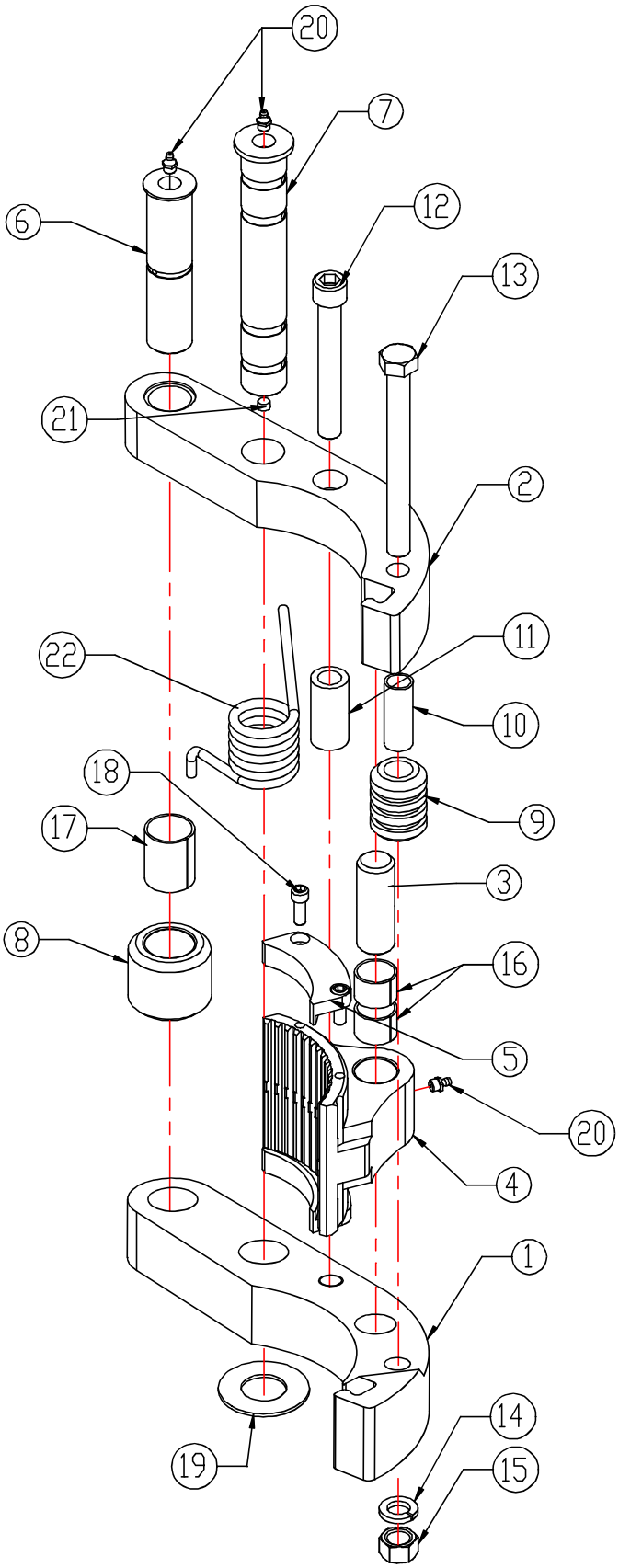
REV. #	LOG #	DATE
		6/11/09



Item #	Qty.	Part Number	Part Name
1	1	BUCD5527	OUTSIDE DOOR BOTTOM PLATE
2	1	BUCD5526	OUTSIDE DOOR TOP PLATE
3	1	BUCD5530 ⟨3⟩	INSERT PIN
4	1	BUCD5513	PIVOTING INSERT
5	2	BUCD5514	DIE CLIP
6	1	BUCD5515	ROLLER PIN
7	1	BUCD5516	PIVOT PIN
8	1	BUCD5519	DOOR ROLLER
9	1	BUCD5523-01	GROOVED DOOR SPRING
10	1	BUCD5541	FRONT DOOR SPRING SPACER
11	1	BUCDP8509	DOOR SPACER
12	1	1177-A	3/4"-10 X 5 1/2" SHCS
13	1	1255	HHCS 3/4"-10 X 7 1/2"
14	1	1171	3/4" LOCKWASHER
15	1	1176-A	3/4" GR. 8 NUT
16	2	20DU16	DU BEARING 1 1/4" X 1"
17	1	BUCS4027	DU BEARING 1 1/2" X 2"
18	4	1041	3/8-16x1 1/4 SHCS
19	1	2025	TONG DOOR THRUST SPACER
20	3	1001	1/8 NPT ZERT
21	1	1607	1/8" FLUSH PLUG
22	1	BUCD5525	TORSION SPRING

⟨3⟩ 01/25/05 - Removed grease holes & groove.

OUTSIDE DOOR ASSEMBLY

FOR BUCD55XHT & -01
ASSEMBLY NO. BUCD5537

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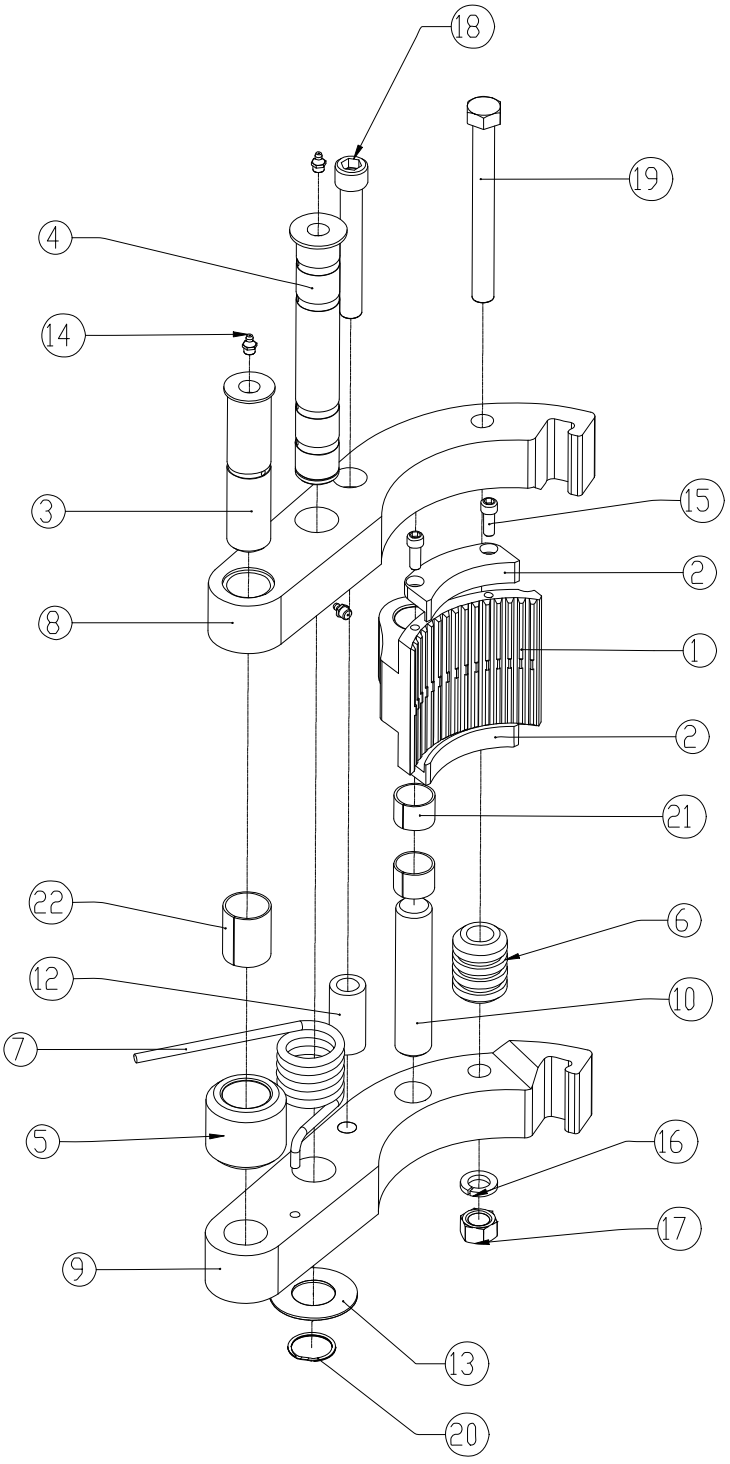
REV. #	LOG #	DATE
3		12/05/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD55XHT\BUCD5537 Door O rev3.wpg



Item #	Qty.	Part Number	Part Name
1	1	BUCD5513	PIVOTING INSERT
2	2	BUCD5514	DIE CLIP
3	1	BUCD5515	ROLLER PIN
4	1	BUCD5516-01	PIVOT PIN
5	1	BUCD5519	DOOR ROLLER
6	1	BUCD5523-01	GROOVED DOOR SPRING
7	1	BUCD5525	TORSION SPRING
8	1	BUCD5526	OUTSIDE TOP DOOR (XHT)
9	1	BUCD5527	OUTSIDE BOTTOM DOOR (XHT)
10	1	BUCD5530	INSERT PIN
11	1	BUCD5541	FRONT DOOR SPRING SPACER
12	1	BUCDP8509	DOOR SPACER
13	1	2025	TONG DOOR THRUST SPACER
14	3	1001	1/8 NPT ZERT
15	4	1041	3/8-16x1 1/4 SHCS
16	1	1171	3/4" LOCKWASHER
17	1	1176-A	3/4" GR. 8 NUT
18	1	1177-A	3/4"-10 X 5 1/2" SHCS
19	1	1255	HHCS 3/4"-10 X 7 1/2"
20	1	1927	SPIROLOX RETAINING RING (RSN-150)
21	2	20DU16	GARLOCK
22	1	24DU32	1 1/2" X2" DU BEARING
23	1	BUDT55-05000A	5" DOVETAIL DIE ADAPTER ASSEMBLY.

OUTSIDE DOOR ASSEMBLY

FOR BUCD55XHT-02
ASSEMBLY NO. BUCD5537-01

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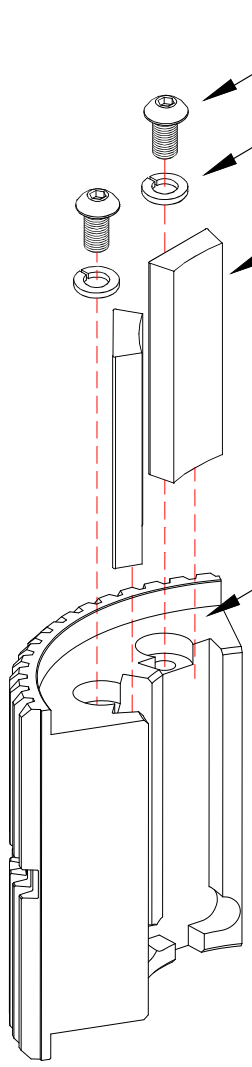
		6/11/09
REV. #	LOG #	DATE



3/8"-16 x 3/4" BUTTON HEAD CSX
P/N: 1061
(2) REQD.

3/8" LOCKWASHER
P/N: 134
(2) REQD.

1 1/4" x 3 7/8" DOVETAIL STRIP DIES
DTI1601 - 1/2" Thick
DTI1601D - 1/2" Thick Diamond
DTI1622 - 9/16" Thick
DTI1632 - 5/8" Thick
DTI1642 - 11/16" Thick
DTI1661 - 13/16" Thick
DTI1662 - 1 1/4" Thick

DOVETAIL DIE ADAPTERS

P/N: BUDT55-02375	2 3/8"	P/N: BUDT55-04125	4 1/8"
P/N: BUDT55-02875	2 7/8"	P/N: BUDT55-04250	4 1/4"
P/N: BUDT55-03125	3 1/8"	P/N: BUDT55-04500	4 1/2"
P/N: BUDT55-03375	3 3/8"	P/N: BUDT55-04750	4 3/4"
P/N: BUDT55-03500	3 1/2"	P/N: BUDT55-04875	4 7/8"
P/N: BUDT55-03625	3 5/8"	P/N: BUDT55-05000	5"
P/N: BUDT55-03750	3 3/4"	P/N: BUDT55-05125	5 1/8"
P/N: BUDT55-03875	3 7/8"	P/N: BUDT55-05250	5 1/4"
P/N: BUDT55-04000	4"	P/N: BUCX55005500	5 1/2"

5 1/2" LOCKJAW
DRILL PIPE BACKUP
DOVETAIL DIE ADAPTER

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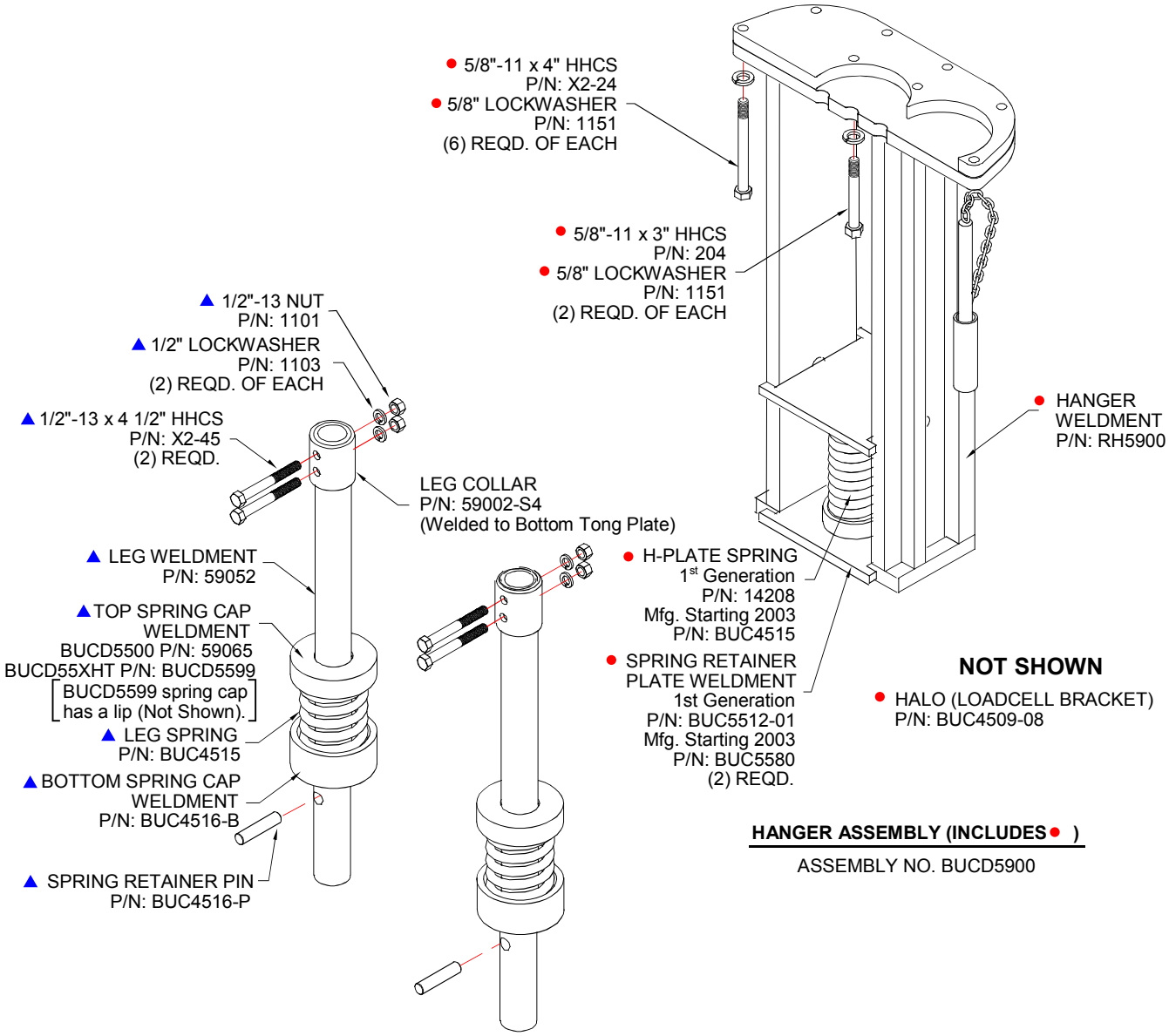
1		04/15/09
REV. #	LOG #	DATE



HANGER ASSEMBLY (INCLUDES ●)

ASSEMBLY NO. BUCD5900

LEG ASSEMBLY (INCLUDES ▲)

BUCD5500 ASSEMBLY NO. BUC5570-02
BUCD55XHT ASSEMBLY NO. BUC5570-03

5 1/2" XHT TONG & 5 1/2" LOCKJAW™ DP BACKUP MOUNTING KIT ASSEMBLY

BUCD5500 ASSEMBLY NO. MK5900
BUCD55XHT ASSEMBLY NO. MK5900-01

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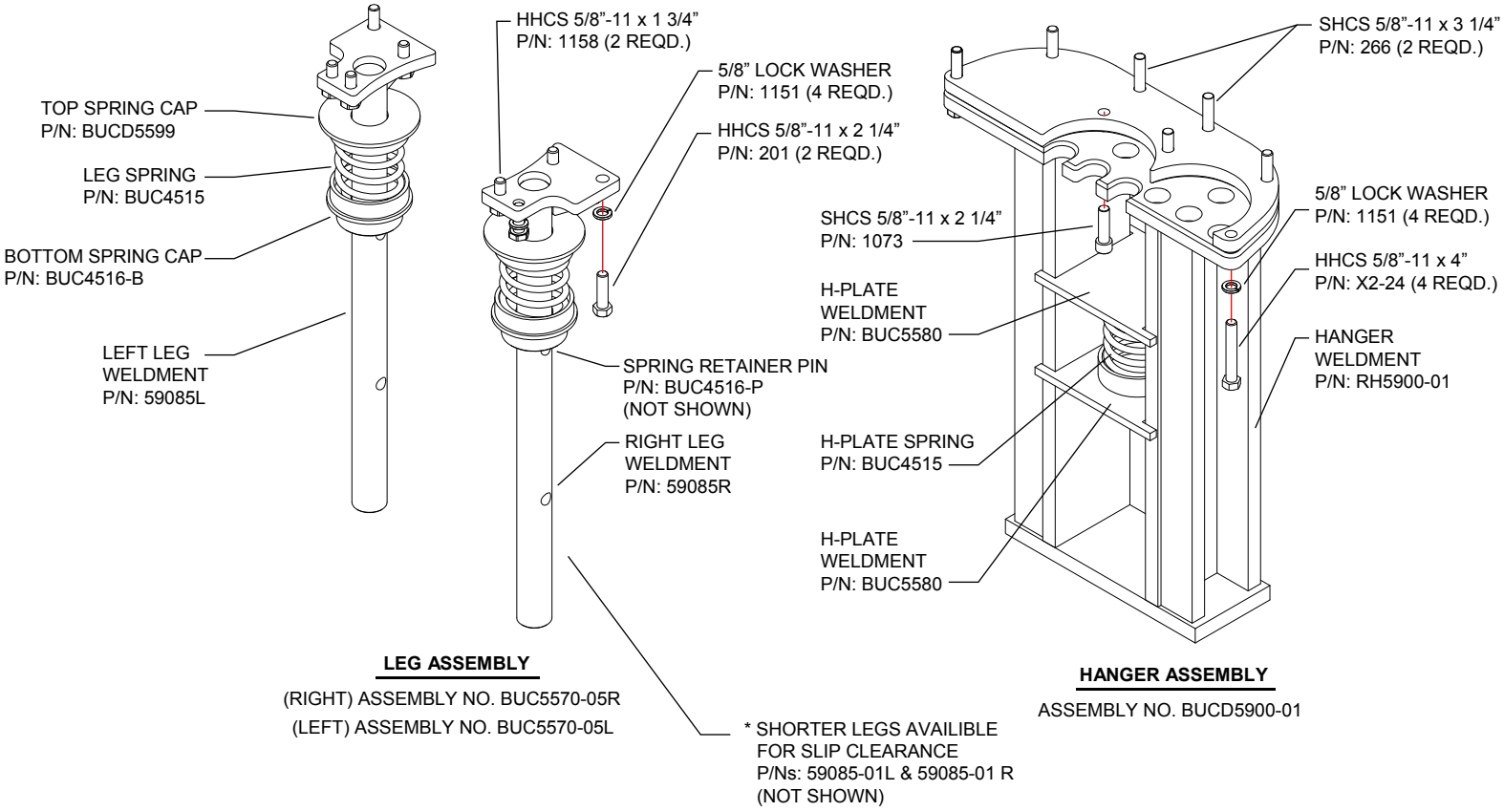
REV. #	LOG #	DATE
1		02/25/04

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD55XHT\Mounting Kit rev1.wpg



LEG ASSEMBLY

(RIGHT) ASSEMBLY NO. BUC5570-05R

(LEFT) ASSEMBLY NO. BUC5570-05L

HANGER ASSEMBLY

ASSEMBLY NO. BUCD5900-01

MOUNTING KIT ASSEMBLY FOR CLE5500XHT-02 / BUCD55XHT-02

ASSEMBLY NO. MK5900-02

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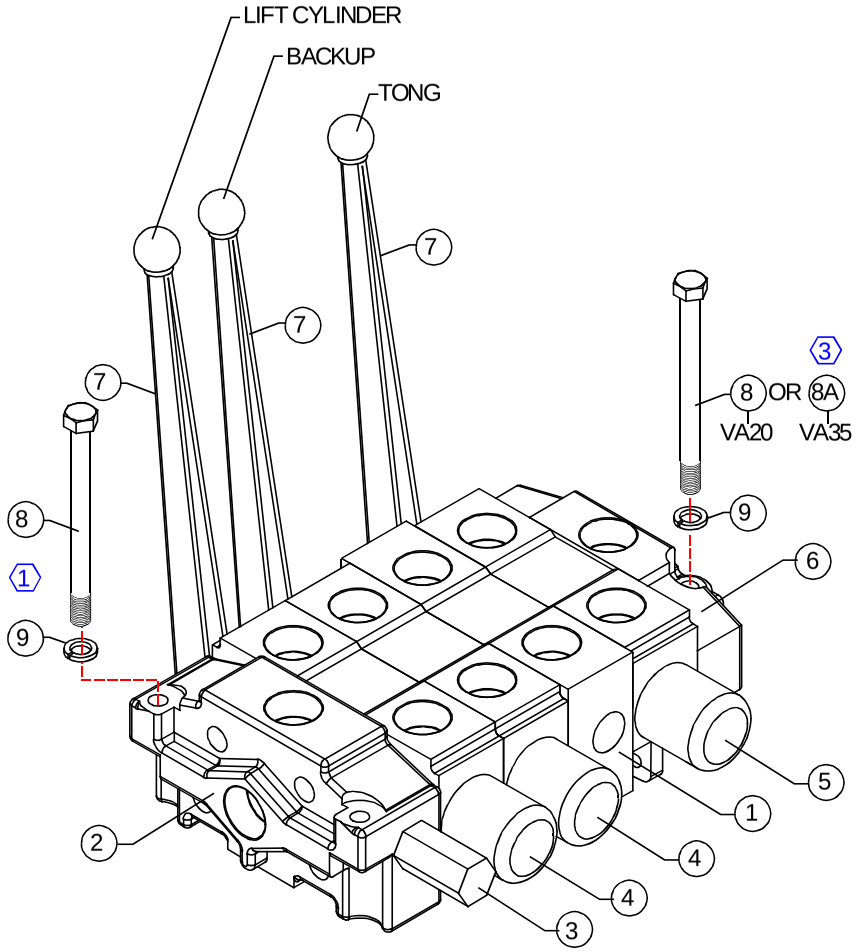
REV. #	LOG #	DATE
		6/11/09

A20 VALVE BANK ASSEMBLY

Item #	Qty.	Part Number	Description
1	1	55201	CONTROL VALVE ASSEMBLY - MODIFIED VA20-WDA3
			(MFG. BEFORE 04/15/04)
2 OR	1	VA20-MOD	WORK SECTION (MFG. AFTER 04/15/04)
5 OR	1	86051	MOTOR BLOCK VALVE BODY (MFG. AFTER 06/2007)
	1	86052	MOTOR BLOCK VALVE CARTRID. (MFG. AFTER 06/2007)
2	1	VA20-AA440	INLET VALVE W/O RELIEF
3	1	VA20-MRV-1	RELIEF CARTRIDGE
4	2	VA20-DA3	WORK SECTION
5	1	VA20-MA3	WORK SECTION
6	1	VA20-TR44	OUTLET SECTION
1 7	3	A20-V1526K-8	A20 8" HANDLE
1 8	3	1072	HHCS 3/8"-16 x 3 3/4" (COMPONENT OF KIT P/N: 4 BANK)
9	3	134	LOCKWASHER 3/8" (COMPONENT OF KIT P/N: 4 BANK)

A35 VALVE BANK ASSEMBLY

Item #	Qty.	Part Number	Description
1	1	14213	CONTROL VALVE ASSEMBLY - MODIFIED VA35-WDA4
			(MFG. BEFORE 04/15/04)
2 OR	1	VA35-MOD	WORK SECTION ASSEMBLY (MFG. AFTER 04/15/04)
5 OR	1	86051	MOTOR BLOCK VALVE BODY (MFG. AFTER 06/2007)
	1	86052	MOTOR BLOCK VALVE CARTRID. (MFG. AFTER 06/2007)
2	1	VA35-AA440	INLET VALVE W/O RELIEF
3	1	DVG35-HMRV 4	RELIEF CARTRIDGE
4	2	VA35-DA4	WORK SECTION
5	1	VA35-MA4	WORK SECTION
6	1	VA35-TR55	OUTLET SECTION
7	3	A35-V1526K-8	A35 8" HANDLE
1 8	2	X2-40 3	HHCS 1/2"-13 x 4 1/4" 3
3 8A	1	X2-45	HHCS 1/2"-13 x 4 1/2"
1 9 3	3	1103	LOCKWASHER 1/2"



VALVE BANK ASSEMBLY

Rev.	Date	Description
5	10/29/07	Item 1 - Added 86051 & 86052 for Production after 06/2007.
4	08/19/05	Item 3 - Chg.PN from A35-MRV-1 to DVG35-HMRV; ECN#05-0064.
3	12/13/04	Item 8 - Chg. Length from 5" to 4 1/4", PN from X2-79 to X2-40.
		Item 8A - Added Part. Item 9 - Chg. Qty. from 2 to 3.
2	10/21/04	Item 1 - Added VA20-MOD & VA35-MOD for Production after 04/15/04.
1	06/10/02	Item 8 & 9 - Added Part.

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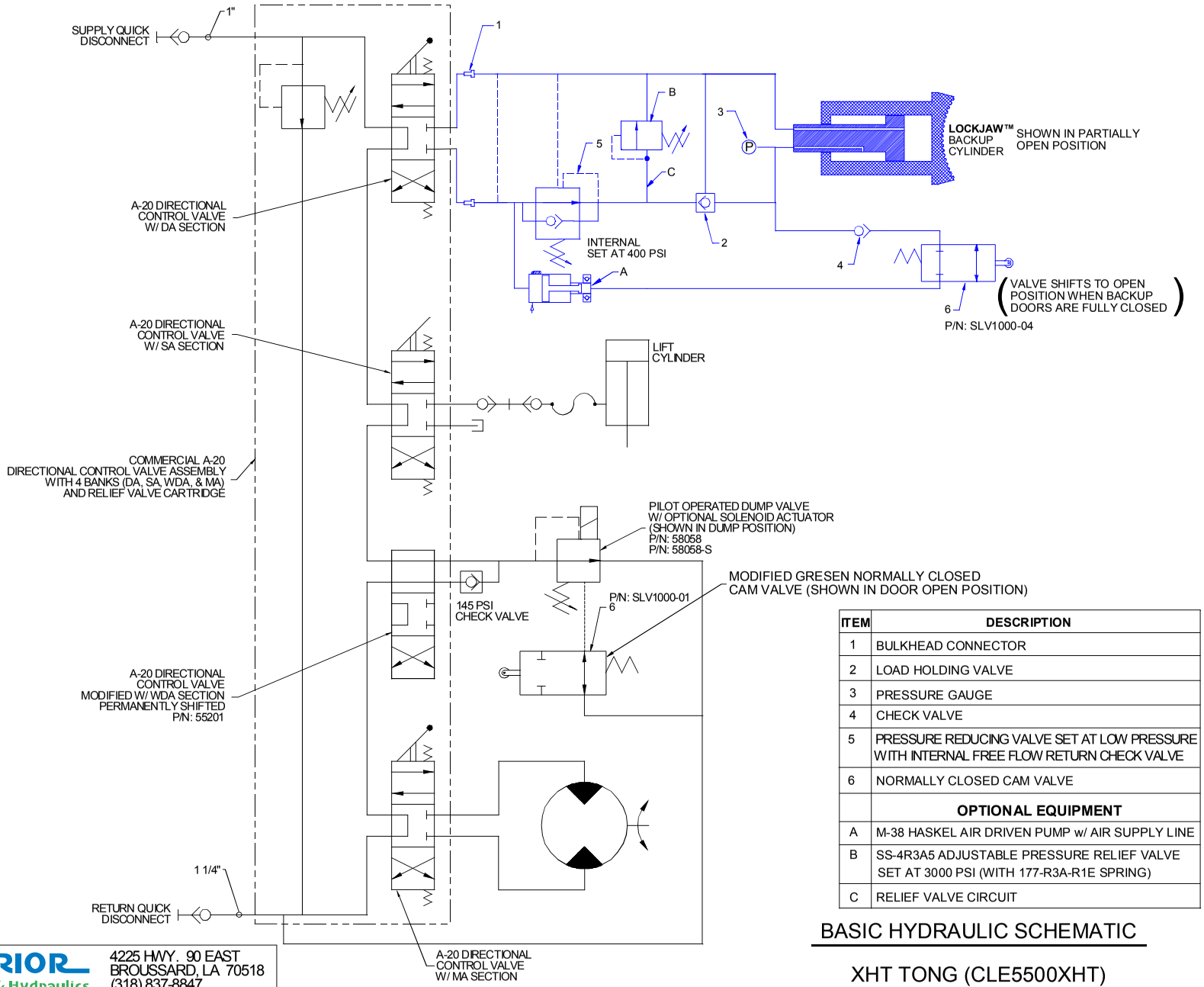
REV. #	LOG #	DATE
5		10/29/07

REF: P:\Manuals\Equip Manuals\Dwgs\Valves\Valve Bank 4 rev5.wpg


SUPPLY QUICK DISCONNECT
1"
1
B
3
5
C
LOCKJAW™ BACKUP CYLINDER
SHOWN IN PARTIALLY OPEN POSITION
A-20 DIRECTIONAL CONTROL VALVE W/ DA SECTION
INTERNAL SET AT 400 PSI
2
4
A
VALVE SHIFTS TO OPEN POSITION WHEN BACKUP DOORS ARE FULLY CLOSED
6
P/N: SLV1000-04
A-20 DIRECTIONAL CONTROL VALVE W/ SA SECTION
LIFT CYLINDER
COMMERCIAL A-20 DIRECTIONAL CONTROL VALVE ASSEMBLY WITH 4 BANKS (DA, SA, WDA, & MA) AND RELIEF VALVE CARTRIDGE
PILOT OPERATED DUMP VALVE W/ OPTIONAL SOLENOID ACTUATOR (SHOWN IN DUMP POSITION)
P/N: 58058
P/N: 58058-S
MODIFIED GRESEN NORMALLY CLOSED CAM VALVE (SHOWN IN DOOR OPEN POSITION)
145 PSI CHECK VALVE
P/N: SLV1000-01
6
A-20 DIRECTIONAL CONTROL VALVE MODIFIED W/ WDA SECTION PERMANENTLY SHIFTED P/N: 55201
1 1/4"
RETURN QUICK DISCONNECT
A-20 DIRECTIONAL CONTROL VALVE W/ MA SECTION

ITEM	DESCRIPTION
1	BULKHEAD CONNECTOR
2	LOAD HOLDING VALVE
3	PRESSURE GAUGE
4	CHECK VALVE
5	PRESSURE REDUCING VALVE SET AT LOW PRESSURE WITH INTERNAL FREE FLOW RETURN CHECK VALVE
6	NORMALLY CLOSED CAM VALVE
	OPTIONAL EQUIPMENT
A	M-38 HASKEL AIR DRIVEN PUMP w/ AIR SUPPLY LINE
B	SS-4R3A5 ADJUSTABLE PRESSURE RELIEF VALVE SET AT 3000 PSI (WITH 177-R3A-R1E SPRING)
C	RELIEF VALVE CIRCUIT

BASIC HYDRAULIC SCHEMATIC

XHT TONG (CLE5500XHT)
LOCKJAW™ DRILL PIPE BACKUP (BUCD5500)

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES ARE NOT ILLUSTRATED IN THIS SCHEMATIC

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REV. #	LOG #	DATE
1		11/20/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD5500\Schematic rev1.wpg

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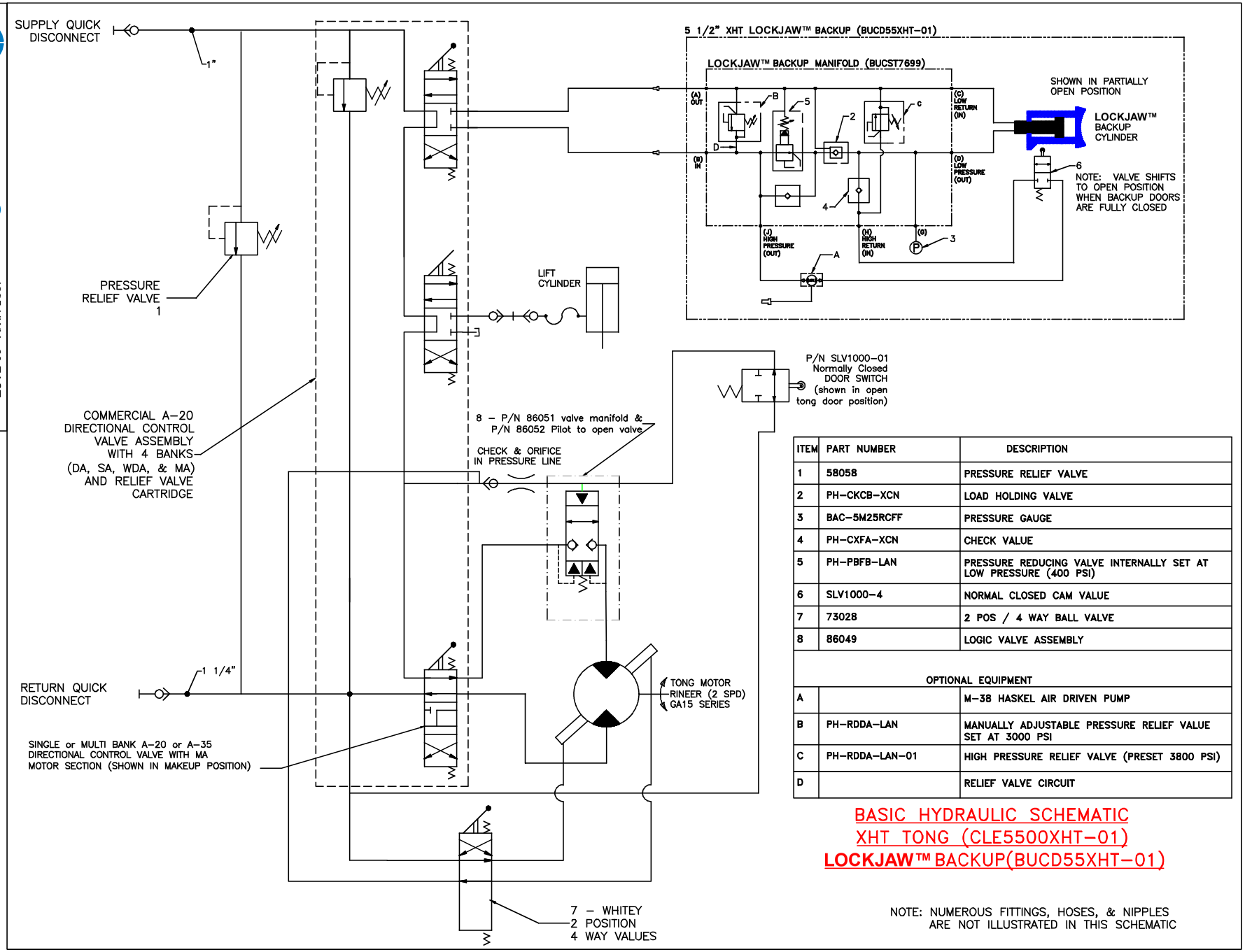
REV. #	LOG #	DATE
		4/15/09


SUPPLY QUICK DISCONNECT
1"
PRESSURE RELIEF VALVE 1
COMMERCIAL A-20 DIRECTIONAL CONTROL VALVE ASSEMBLY WITH 4 BANKS (DA, SA, WDA, & MA) AND RELIEF VALVE CARTRIDGE
LIFT CYLINDER
8 - P/N 86051 valve manifold & P/N 86052 Pilot to open valve
CHECK & ORIFICE IN PRESSURE LINE
P/N SLV1000-01 Normally Closed DOOR SWITCH (shown in open tong door position)
5 1/2" XHT LOCKJAW™ BACKUP (BUCD55XHT-01)
LOCKJAW™ BACKUP MANIFOLD (BUCST7699)
SHOWN IN PARTIALLY OPEN POSITION
LOCKJAW™ BACKUP CYLINDER
NOTE: VALVE SHIFTS TO OPEN POSITION WHEN BACKUP DOORS ARE FULLY CLOSED
(A) OUT
(B) IN
(C) LOW RETURN (IN)
(G) LOW PRESSURE (OUT)
(J) HIGH PRESSURE (OUT)
(H) HIGH RETURN (IN)
RETURN QUICK DISCONNECT
1 1/4"
SINGLE or MULTI BANK A-20 or A-35 DIRECTIONAL CONTROL VALVE WITH MA MOTOR SECTION (SHOWN IN MAKEUP POSITION)
TONG MOTOR RINEER (2 SPD) GA15 SERIES
7 - WHITEY 2 POSITION 4 WAY VALUES

ITEM	PART NUMBER	DESCRIPTION
1	58058	PRESSURE RELIEF VALVE
2	PH-CKCB-XCN	LOAD HOLDING VALVE
3	BAC-5M25RCFF	PRESSURE GAUGE
4	PH-CXFA-XCN	CHECK VALUE
5	PH-PBFB-LAN	PRESSURE REDUCING VALVE INTERNALLY SET AT LOW PRESSURE (400 PSI)
6	SLV1000-4	NORMAL CLOSED CAM VALUE
7	73028	2 POS / 4 WAY BALL VALVE
8	86049	LOGIC VALVE ASSEMBLY
	OPTIONAL EQUIPMENT	
A		M-38 HASKEL AIR DRIVEN PUMP
B	PH-RDDA-LAN	MANUALLY ADJUSTABLE PRESSURE RELIEF VALUE SET AT 3000 PSI
C	PH-RDDA-LAN-01	HIGH PRESSURE RELIEF VALVE (PRESET 3800 PSI)
D		RELIEF VALVE CIRCUIT

BASIC HYDRAULIC SCHEMATIC
XHT TONG (CLE5500XHT-01)
LOCKJAW™ BACKUP(BUCD55XHT-01)

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES ARE NOT ILLUSTRATED IN THIS SCHEMATIC

P:\Manuals\Manual CAD Drawings\BUCD55XHT-01\CLE5500XHT01 BUCD55XHT-01 Schematic.dwg

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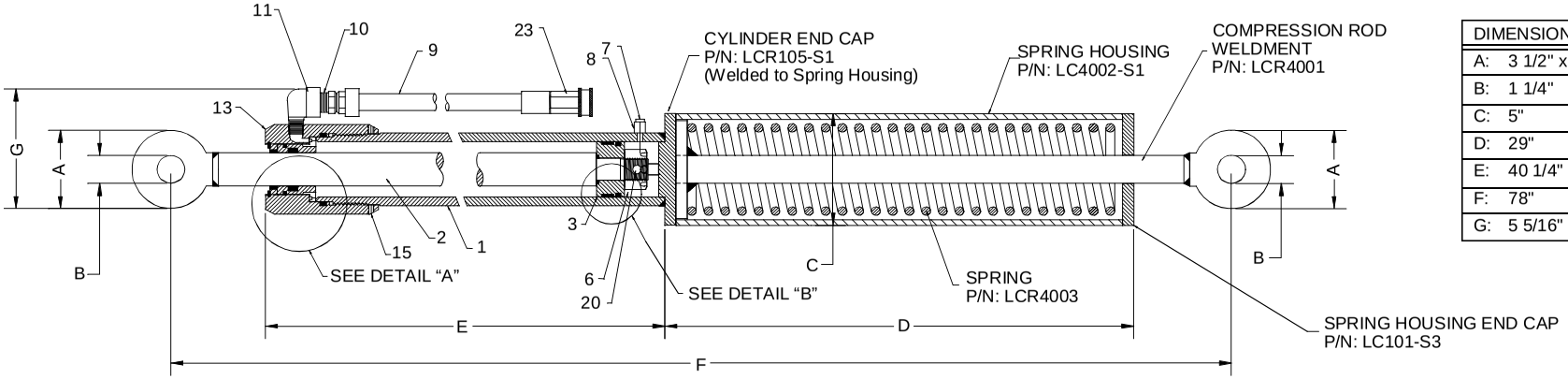
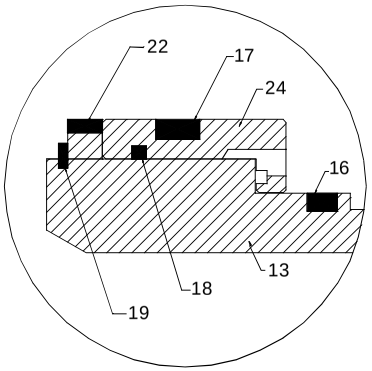


DIMENSIONAL DATA
A: 3 1/2" x 3/4"
B: 1 1/4"
C: 5"
D: 29"
E: 40 1/4"
F: 78"
G: 5 5/16"

★ SEAL KIT P/N: ASAP100

BILL OF MATERIALS

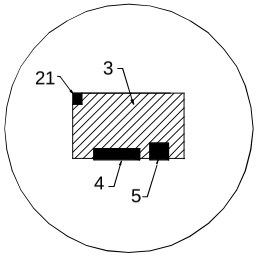
Item	Qty.	Description	P/N
1	1	HYD/AIR CYLINDER BARREL	LCR105
2	1	CYLINDER ROD WELDMENT	LCR112
3	1	PISTON	LCR106
★ 4	1	WEARBAND	W25000500
★ 5	1	POLYPACK 2 1/8" x 2 1/2" x 3/16"	18702125
6	1	1"-12 SLOTTED HEX NUT	1209
7	1	1/2" FLUSH PLUG W/ 1/8" ORIFICE	1657
8	1	1/2" HALF COLLAR	1380
9	1	1/2" x 120" HOSE ASSY. MNPT x FJIC SWVL	LCR107-A
10	1	3/8" MNPT x 1/2" MJIC ADAPTER	1466
11	1	3/8" STREET EL W/ORIFICE	LCR109
12	---	----------	----------
13	1	GLAND CAP	LCR119
14	---	----------	----------
15	2	1/4"-20 x 3/8" SET SCREW	1015
★ 16	1	O RING 2 7/8"ID, 3 1/4"OD, 3/16"W	2-336
★ 17	1	POLYPACK 1 1/2" x 1 7/8" x 3/8"	18701500-375
★ 18	1	O RING 2"ID, 2 1/4"OD, 1/8"W	2-226
19	1	INTERNAL SNAP RING (N-1300-225)	1947
20	1	1/4" x 1 1/2" ROLL PIN	1008-A
★ 21	1	O RING 1"ID, 1 1/4"OD, 1/8"W	2-214
★ 22	1	SEAL NP CR14938	CR14938
23	1	QUICK DISCONNECT 1/2" FEMALE SNAPTITE	1430
24	1	GLAND	LCR113



DETAIL "A"
SCALE: 3X

SPECIFICATIONS - B

MAXIMUM SPRING TRAVEL (PRELOAD TO SOLID)	5.449 in.
AVAILABLE SPRING TRAVEL AFTER PICKING UP TONG (LOADED HEIGHT TO SOLID)	3.00 in.
MAXIMUM ALLOWABLE LOAD (SPRING FULLY COMPRESSED)	7,908 lbs.
PRESSURE REQUIRED TO LIFT MAXIMUM ALLOWABLE LOAD	2,519 psi
MAXIMUM ALLOWABLE INTERNAL PRESSURE	3,000 psi
CYLINDER I.D.	2.50 in.
ROD O.D.	1.50 in.
STROKE	34.94 in.



DETAIL "B"
SCALE: 3X

LIFT CYLINDER ASSEMBLY

ASSEMBLY NUMBER LCR400-A

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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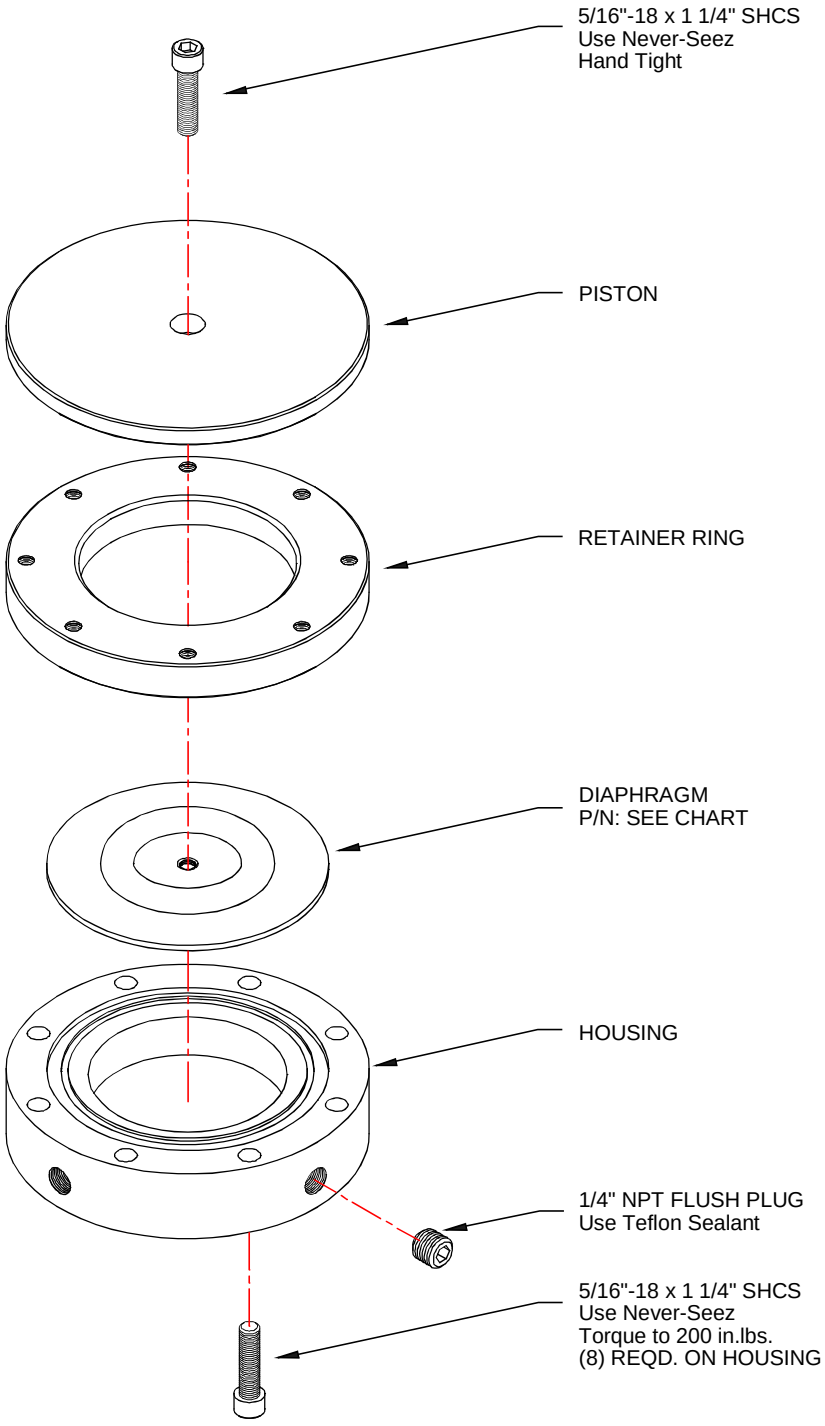
CLINCHER® LOAD CELL AND TORQUE GAUGE ASSEMBLIES

The **CLINCHER®** Tong and Backup are available in versions which accommodate compression load cells or tension style load cells. All information contained in this Technical Manual refers to products which utilize compression load cells. Contact SUPERIOR for information concerning products using tension load cells.

Part Number	SM40-28C
Torque Rating	40,000 ft lbs
Handle Length	28 inches
Loadcell Type	Compression
Loadcell Manufacturer	SUPERIOR MANUFACTURING & HYDRAULICS
Loadcell Part Number	CLC200
Torque Gauge Mfr.	TOTCO or equivalent
Torque Gauge Size	6"
Gauge Mount	“L” Bracket
Hose Length	6 ft.
Assembly Documentation	Calibration Certificate

CLINCHER® Load cells and Torque Gauges are produced by several manufacturers. The information provided by MD TOTCO or Acadiana Oilfield Instruments may not be applicable to all torque gauges or load cells. This reference information is provided with the permission of MD TOTCO and Acadiana Oilfield Instruments.



LOAD CELL SIZE	DIAPHRAGM P/N
6.44 SQ.IN.	CLC203
8.0 SQ.IN.	CLC205
12.0 SQ.IN.	CLC206
16.1 SQ.IN.	CLC207
25.0 SQ.IN.	CLC208

COMPRESSION LOAD CELL

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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1		07/03/02

REF: P:\Manuals\Equip Manuals\Dwgs\Load Cell Comp rev1.wpg

CLINCHER® LOAD CELL AND TORQUE GAUGE ASSEMBLIES

To request copy of
Compression Torque System
Technical Manual,
please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com

SECTION 13 MOTOR SERVICE MANUALS

To request copy of Rineer Motor Service Manuals, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com

SECTION 14 VALVE TECHNICAL DATA

To request copy of Valve Technical Data, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com